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FOOD AND AGRICULTURE: CLUSTER AND WORKFORCE NEEDS ASSESSMENT
SACRAMENTO CAPITAL REGION

April 2016

JPMorgan Chase & Co.

SACOG

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INTRODUCTION

Across the Sacramento Capital region, including the six counties of El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba, approximately 75 percent of land is agricultural, forest, or other open space.

Agriculture in the Sacramento Capital region is not only highly productive and diverse, it is a major economic driver. However, agriculture is often overlooked due to a poor understanding of how the industry's economic impacts reverberate throughout the larger regional economy.

In response, the Sacramento Area Council of Governments (SACOG) has shifted the planning paradigm to more explicitly include agriculture and rural areas. Through cutting-edge technical work and stakeholder engagement, SACOG's Rural-Urban Connections Strategy (RUCS) project strives to bring the region's understanding of rural issues on par with those in urban settings and has demonstrated how policies and strategies impact both parts of the region.

SACOG, the principal researcher for this report, has partnered with Valley Vision and Los Rios Center of Excellence to explore connections among the Food and Agriculture cluster, the labor force, and the larger regional economy. The report draws on recent employment and other data to begin to quantify the substantial economic contribution of the regional food system.

Given the broad nature of the cluster, however, these data sources don't capture the full network of economic impacts associated with the food system, thus providing only a partial picture of the role of food and agriculture in the regional economy. To address this data limitation, the report also draws on a RUCS impact analysis to further illustrate food system components that cannot be quantified through other data sources. The full findings of this larger impact analysis will be available in July 2016.

This report is part of a series covering the six Next Economy identified clusters, including the areas of Advanced Manufacturing, "Clean Economy," Education and Knowledge Creation, Information and Communications Technologies, and Life Sciences and Health Services. Each report provides an overview of the characteristics, industry trends and projections, and economic impact of the clusters. These research reports will be used to develop cluster-based workforce action plans that set priorities and recommend strategies for addressing critical workforce gaps. More information about these Sacramento Capital region workforce action plans can be found at www.valleyvision.org.

SACOG is an association of local governments in the six-county Sacramento area that provides transportation planning and funding and serves as a forum for regional issues, including linking land use, transportation, and air quality. **RUCS** is the region's rural economic and sustainability strategy, which is complementary to the **Blueprint**—the region's overall growth strategy.

RUCS Topical Areas

	The Infrastructure of Agriculture
	Regulations
	Land Use and Conservation
	Economic Opportunities
	Forest Management

OVERVIEW OF THE FOOD AND AGRICULTURE CLUSTER

This report moves beyond the farm to analyze the economic contributions of the larger Food and Agriculture industry cluster in the Sacramento Capital region. An industry cluster is a group of interdependent firms and related institutions that are linked through strong relationships and transactions. The full range of inputs and outputs in the Food and Agriculture cluster include various types and scales of production, markets, and value-added processing in addition to the work on farms, ranches, and fields. Related food industries provide resources and equipment for growing or harvesting crops and processing, packaging, or using crops or animal products to prepare other food products (e.g., bakeries). In this analysis, SACOG divided industries within the Food and Agriculture cluster into the following four subsectors:

Cluster research is a widely accepted practice for developing regional prosperity strategies for sustained job creation and growth that leverage unique regional strengths. Industry clusters increase firm competitiveness through shared infrastructure and a concentrated workforce; reduce operating costs with shorter supply chains; increase the flow of information regarding new business opportunities; and foster innovation with informal collaboration and heightened competition. Economic clusters often serve as the driving force of many regional economies.

Food and Agricultural Production – These firms produce, farm, and harvest crops or animal products. Food and agricultural production firms include grain, seed, nut, vegetable, and fruit farming and harvesting; cotton, hay, and tobacco farming and harvesting; pre- and post-harvest activities; nursery production; dairy production; animal ranching, farming, and production; feedlots; aquaculture; apiculture; farm labor contractors; and farm management services.
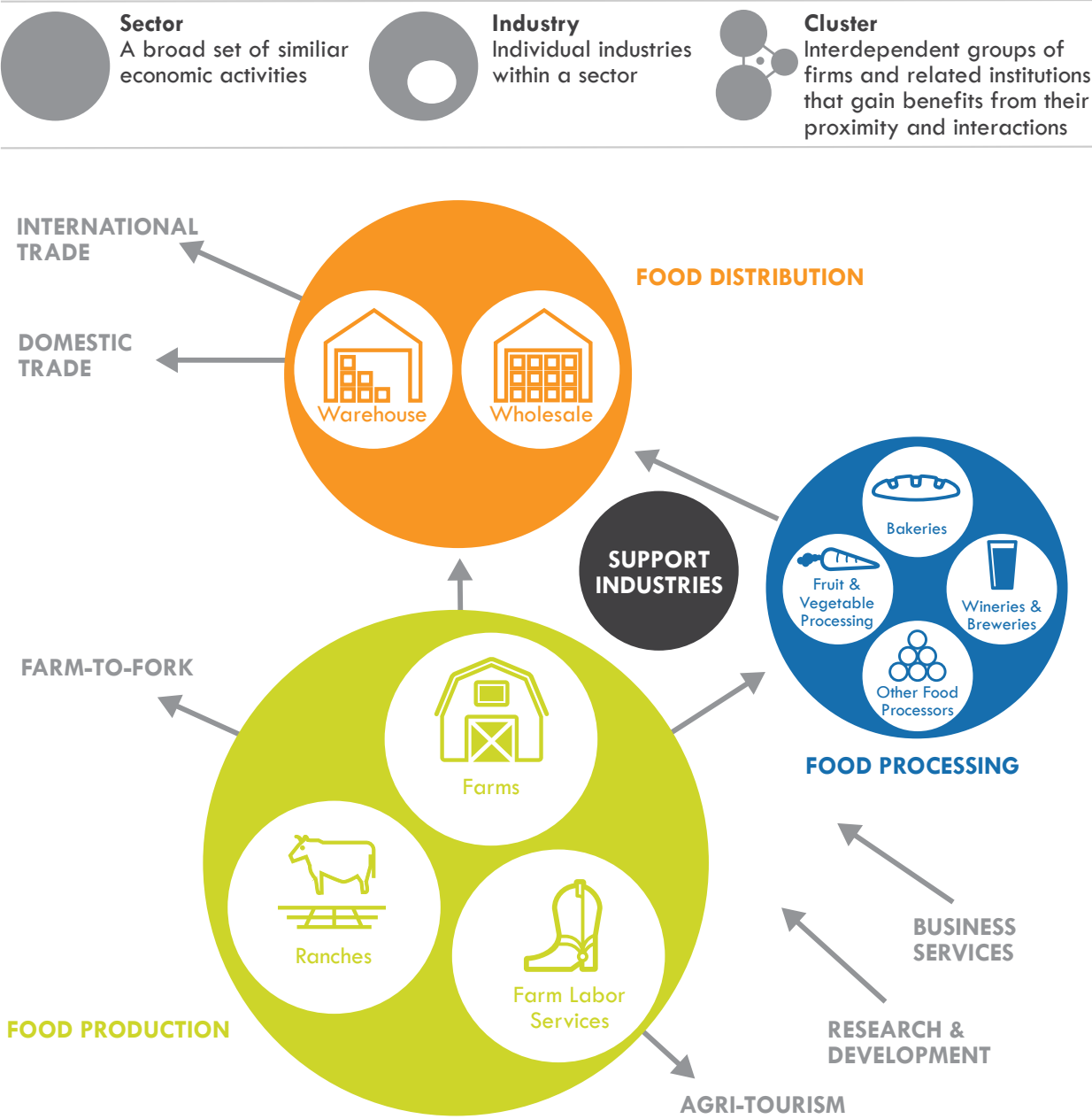
Food and Agricultural Processing – Firms in this segment of the cluster process, mill, manufacture, package, and/or prepare other food products using crop or animal production as inputs. Food and agriculture processing firms include flour, rice, and corn milling; fat and oil processing; meat processing and/or rendering; specialty canning; creameries; bakeries and other prepared food manufacturing; and breweries, wineries, and distilleries.

Food and Agricultural Distribution – These firms store, transport, or sell crop or animal products in bulk quantities as merchant wholesalers. Food and agriculture distribution firms include grocery, meat, dairy, grain, fruit and vegetable, confectionary, and alcohol merchant wholesalers; refrigerated and farm product warehousing and storage; and food service contractors.

Food and Agricultural Support – These firms support agricultural production by providing resources and equipment for growing and harvesting crop and animal products. Food and agriculture distribution firms include animal production support, fertilizer manufacturing, pesticide manufacturing, farm and food machinery and equipment manufacturing, farm supply merchant wholesalers, and nursery and florist merchant wholesalers.

OVERVIEW OF THE FOOD AND AGRICULTURE CLUSTER

Figure 1: Cluster Components: Food and Agricultural Cluster

Sector
A broad set of similiar economic activities

Industry
Individual industries within a sector

Cluster
Interdependent groups of firms and related institutions that gain benefits from their proximity and interactions

INTERNATIONAL TRADE

DOMESTIC TRADE

FOOD DISTRIBUTION

Warehouse

Wholesale

SUPPORT INDUSTRIES

Bakeries

Fruit & Vegetable Processing

Wineries & Breweries

Other Food Processors

FOOD PROCESSING

FARM-TO-FORK

Farms

Ranches

Farm Labor Services

FOOD PRODUCTION

BUSINESS SERVICES

RESEARCH & DEVELOPMENT

AGRI-TOURISM

The Food and Agriculture cluster impacts many elements of the Sacramento Capital region's economy. This study quantifies employment in the cluster's core production, support, processing, and distribution activities (represented by the colored circles above). Due to data limitations, however, the study does not quantify employment in related industries, such as those in gray text in the above graphic.

OVERVIEW OF THE FOOD AND AGRICULTURE CLUSTER

In keeping with other food system studies, SACOG's cluster definition incorporates the direct economic activity resulting from food that is grown, processed, and distributed in the Sacramento Capital region. Further associated economic impacts—such as businesses indirectly providing agriculture or ecosystem services stemming from food production—are not captured in this cluster definition due to data limitations. Notably, the analysis does not quantify the (substantial) employment and impact of food at the point of consumption, such as restaurants, grocery stores, events, institutions, or other business entities. The analysis also does not quantify the effect of agritourism, environmental services, or research and development (R&D), as these elements cannot be isolated out of the aggregate data sets. So while the subsequent cluster analysis does provide an updated investigation into the core activities connected to the food system in the Sacramento Capital region, its data and job figures do not represent the full network of associated economic impacts and employment.

As part of the Next Economy efforts to better understand how the Sacramento Capital region has emerged from the global recession, this report delves into the regional Food and Agriculture cluster, quantifying employment and other data points for its four subsectors. The data analysis begins by describing **current conditions** in the cluster, then explores recent trends as the cluster continues to support the region's economic rebound, and concludes with a look forward to key **challenges and opportunities** in sustaining this recent growth. Consistent with other efforts to update the six Next Economy clusters, this report draws on recent data from the EMSI data series[1] for the year 2014. The work also incorporates other RUCS datasets, analyses, and insights to complement the EMSI data and illustrate areas not quantified in the base data series.
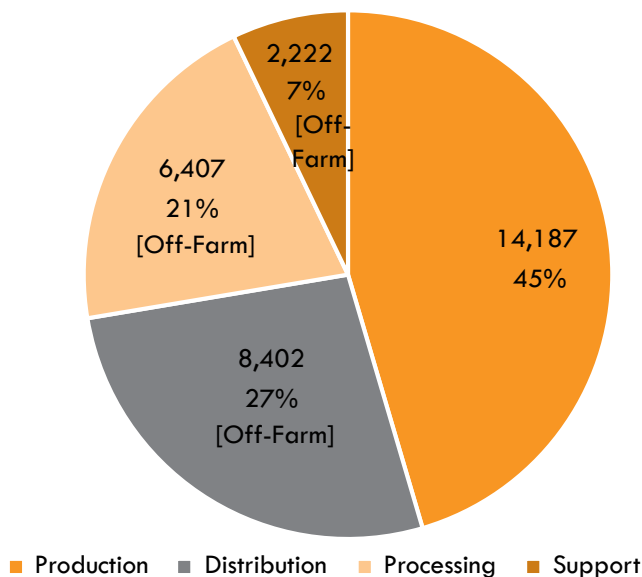

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[1] The Economic Modeling Specialists Intl. (EMSI) dataset aggregates over 90 data sources into a unified look at wages, employment, firm concentration and other indicators. The Los Rios Center of Excellence provided the EMSI data for this project; cluster analysis was conducted by SACOG, and all conclusions are SACOG's alone. The Center of Excellence conducted the workforce and training analysis, Part 4 of this report. The geography of the study is the six-county Sacramento Capital region and the study year is 2014 (unless otherwise noted). The report's EMSI data rollup includes estimates for self-employed and sole proprietor workers.

EMPLOYMENT

The Food and Agriculture cluster is an important part of the Sacramento Capital region's economy. In 2014, the measured subsectors of the cluster included more than 31,200 jobs, which is about 3 percent of total employment in the six-county region. As shown in Figure 2, the largest concentration of these jobs (45 percent) was in food production, specifically the crop production industry. Remaining employment was spread across the distribution (27 percent), processing (21 percent), and support (7 percent) subsectors respectively. Notably, these "off-farm" industries together made up the majority of employment in the Food and Agriculture cluster (55 percent), showcasing how food system job opportunities extend beyond the farm, ranch, and field into other facets of the regional economy. While the support subsector included the lowest number of jobs overall, the region contained a significantly greater proportion of support employment compared to California as a whole.

A **survey** conducted by the California Farm Bureau in 2012 found that many growers in the SACOG region experience labor shortages, and reported a statewide shortage between 10 percent and 30 percent. If the issue persists, this challenge could inhibit further growth in the cluster.

Figure 2: 2014 Food and Agricultural Employment by Subsector[2]

Production   Distribution   Processing   Support

Pie chart values: 14,187 – 45% (Production); 8,402 – 27% [Off-Farm] (Distribution); 6,407 – 21% [Off-Farm] (Processing); 2,222 – 7% [Off-Farm] (Support)

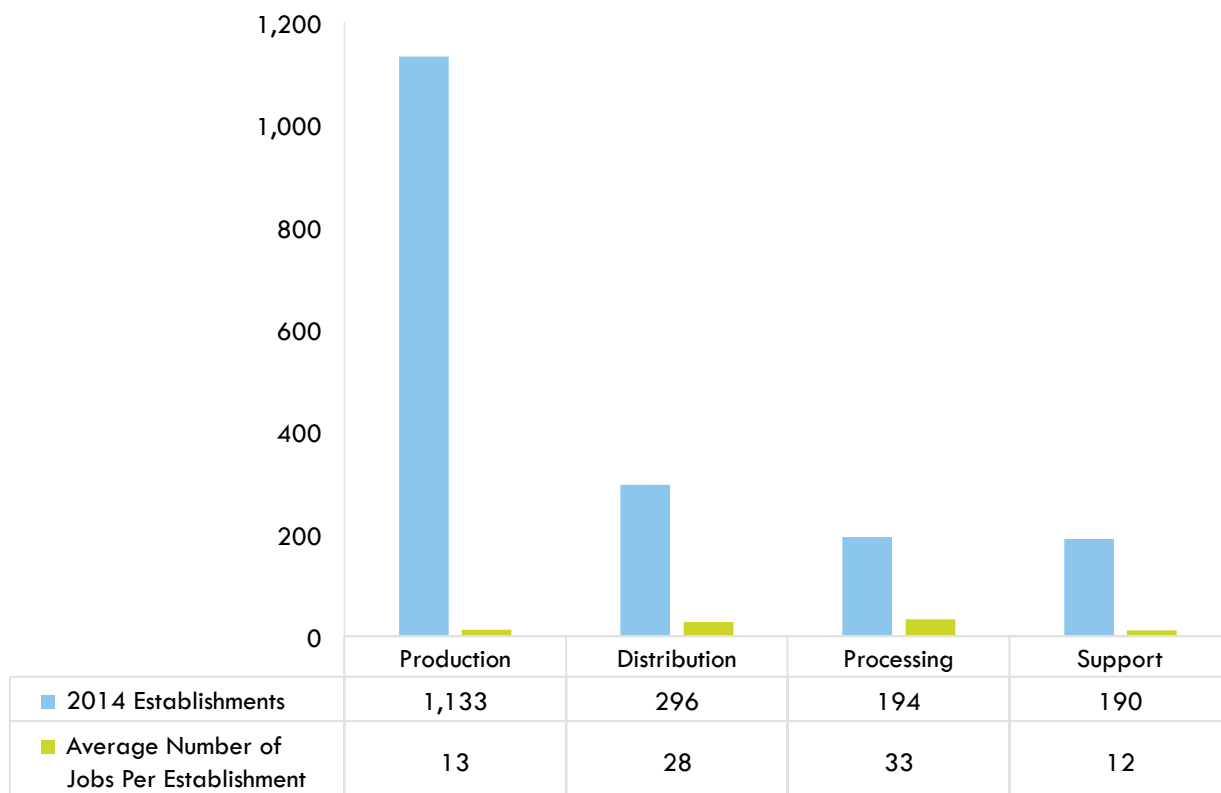[2] EMSI: QCEW Employees, Non-QCEW Employees, and Self-Employed, 2015.2

ESTABLISHMENTS

Overall there are more than 1,800 establishments in the regional Food and Agriculture cluster. Figure 3 displays the total number of establishments and the average number of jobs per establishment for the four cluster subsectors. As shown, the production subsector has the most firms, yet also has one of the lowest averages of workers per establishment compared to other subsectors in the region. This stems from the unique nature of agricultural production compared to many other industries. For example, farmers often draw on off-farm labor contractors at various points in the year. These farm labor contractor establishments each average around 100 employees in the region.

The processing subsector has a smaller number of total establishments, but has the highest average number of workers per establishment. (This total of around 200 processing establishments does not include the components of food processing that occur on farms.) Larger processing facilities in the region—such as fruit and vegetable canning or soft drink manufacturing—on average employ more than 100 workers per establishment. Recent RUCS work has centered on the market opportunity to complement regional food processing activities with a focus on mid-scale facilities, such as food hubs.

An **establishment** is a business providing goods and/or services within an industry, generally engaging in a single type of economic activity and operating from a single physical location. Most employers have only one establishment; however, larger employers may have several.

Figure 3: Establishments and Average Employment by Subsector, 2014[3]

	Production	Distribution	Processing	Support
■ 2014 Establishments	1,133	296	194	190
■ Average Number of Jobs Per Establishment	13	28	33	12

CONCENTRATION OF EMPLOYMENT: REGIONAL AND SUBSECTOR CONCENTRATION

Location quotient (LQ) analysis provides a useful tool to identify regional economic specializations (see box at right). Compared to the state as a whole, the Sacramento Capital region's Food and Agriculture cluster contains many areas of specialization, yet also is less concentrated in several key industries. As shown in Figure 4, the production and processing subsectors in the region have a location quotient that is less than 1, indicating a lower concentration of employment in these areas compared to the state average. Conversely, the distribution and support subsectors in the region have a location quotient higher than 1, highlighting regional concentrations in these industries. The support sector has a particularly high location quotient, as jobs within this subsector are almost twice as concentrated in the region compared to the state average.

A **location quotient** is a ratio that compares regional employment in a particular industry to employment in that same industry at a larger geography (in this case, California). A location quotient of less than 1 indicates a lower proportion of employment for that industry in the Sacramento region than in the state overall. A location quotient of more than 1 indicates a regional industry with a higher concentration of employment compared to the state average.

Within the cluster subsectors, individual industries with regional location quotients significantly above the state average include:

- **Processing** – rice milling (4.37 LQ), rendering and meat byproduct processing (3.63 LQ), dried and dehydrated food manufacturing (3.19 LQ), flour milling (2.88 LQ), roasted nuts and peanut butter manufacturing (2.87 LQ), and soft drink manufacturing (1.79 LQ);

- **Distribution** – farm product warehousing and storage (5.46 LQ); and,

- **Support** – farm machinery and equipment manufacturing (2.19 LQ).

Subsector industries with location quotients significantly below the state average include:

- **Processing** – animal (except poultry) slaughtering (0.20 LQ), tortilla manufacturing (0.20 LQ), perishable prepared food manufacturing (0.25 LQ), and wineries (0.28 LQ);

- **Distribution** – packaged frozen food merchant wholesalers (0.15 LQ), refrigerated warehousing and storage (0.17 LQ), and wine and distilled alcoholic beverage merchants (0.24 LQ); and,

- **Production** – farm management services (0.09 LQ).

While the processing sector includes many of the industries with the highest location quotients (as indicated above), it also includes the most industries with the lowest location quotients. This is why processing in aggregate has the lowest relative concentration of employment compared to the other cluster sectors, even though it includes many individual industries with high location quotients.

CONCENTRATION OF EMPLOYMENT: REGIONAL AND SUBSECTOR CONCENTRATION

Figure 4: Total Employment and Location Quotient by Subsector, 2014[4]
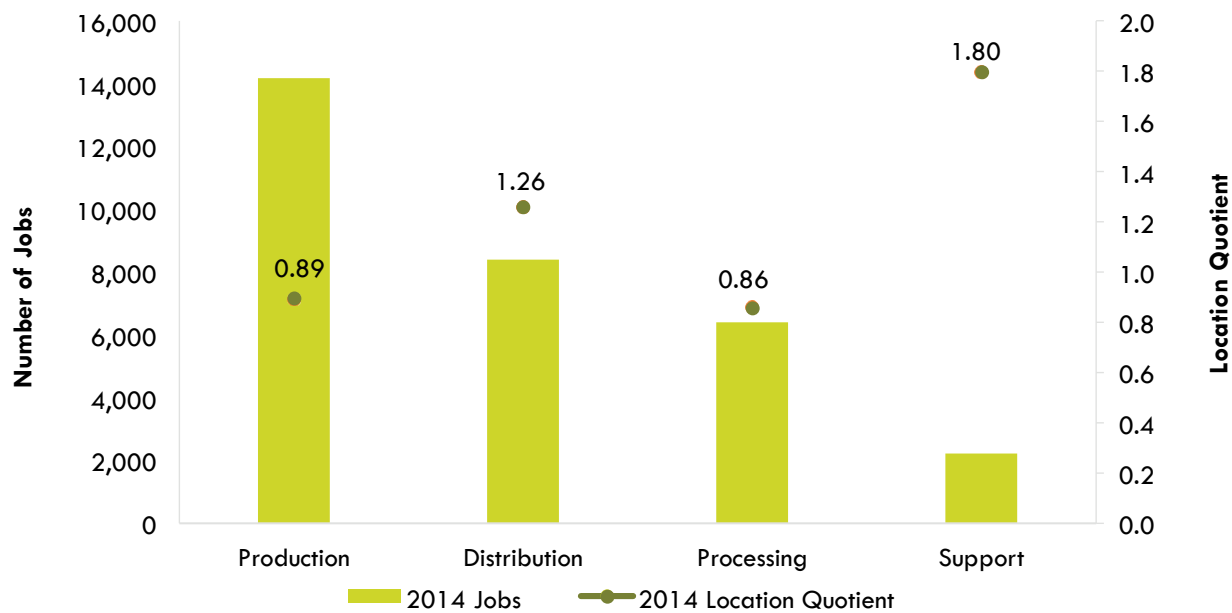
[4] EMSI: QCEW Employees, Non-QCEW Employees, and Self-Employed, 2015.2

CONCENTRATION OF EMPLOYMENT: GEOGRAPHIC CONCENTRATION

Firms in a cluster draw a productive advantage from their geographic concentration. In addition to co-location, firms in a cluster share common resources and technologies and rely on a similar labor pool and institutions. Figure 5a illustrates where employees in the Food and Agriculture cluster are most concentrated in the region, using SACOG's Draft 2015 Employment Inventory.[5] Overall, the largest concentrations of cluster employees are located in the cities of West Sacramento, Sacramento (especially downtown and southeast), and Woodland. Additionally, there is a significant grouping of employees in the Live Oak and Marysville areas and some lesser concentrations of employees in Davis, Rocklin, Galt, and near the community of Courtland in Sacramento County. The hotspot mapping analysis measures where cluster employment is most concentrated; the results show how Food and Agriculture cluster employment extends far beyond the farm. By design, the hotspot analysis does not visually display all areas of activity, just those with distinct co-location. As such, the following maps do not depict all the various food system employment that occurs throughout the entire six-county Sacramento Capital region.

The regional nature of the Food and Agriculture cluster becomes particularly apparent when paired with the RUCS crop map showing acres of agricultural production. Figure 5b provides a simplified version of the crop map. (The full map includes data at the individual field and crop level.) While the production component of the cluster is more dispersed in terms of employment, its substantial agricultural output supports the additional economic activity and jobs found in the other subsectors of the cluster. In other words, without this corresponding agricultural production the cluster's contribution to the regional economy would be severely limited. Future RUCS work under the Food System Multiplier project will show how a decrease in agricultural production would lead to economic contraction throughout the cluster, and throughout the economy as a whole.
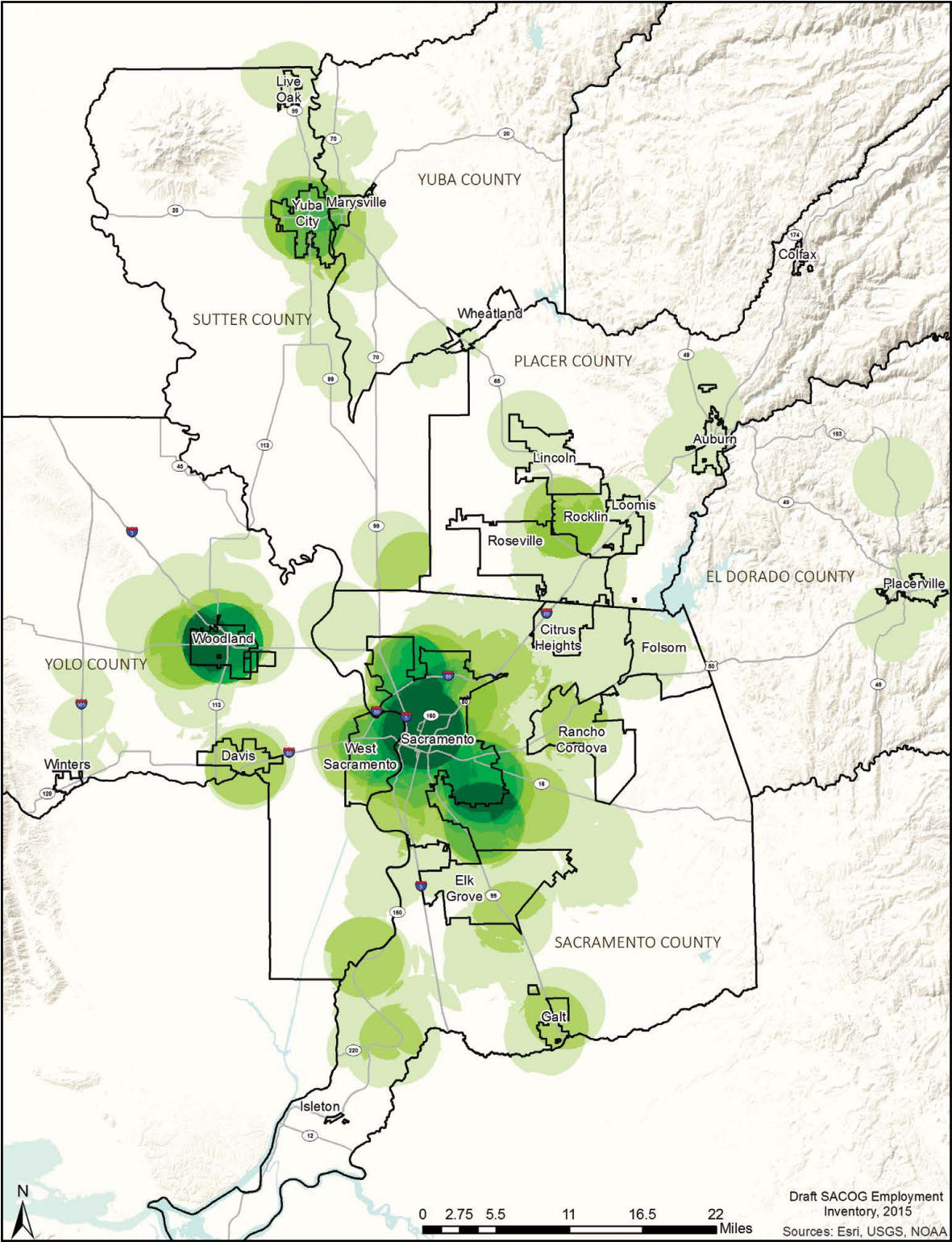
Employment concentrations vary when broken out by cluster subsector, as shown in Figure 5c–5f. Jobs in the production subsector are concentrated around Galt; western Woodland; and the area of Sacramento County between the cities of Sacramento, Rancho Cordova, and Elk Grove. Areas near Marysville and Yuba City, Davis, the communities of Ryde (Sacramento County), and Norton (Yolo County) also include significant concentrations of production jobs. This finding stems from the inclusion of farm labor contractor firms in the production segment of the cluster. These firms may be incorporated in a single facility, but supply labor to farms across the region. Thus, in the production map below, the mapping emphasizes the physical location of farm labor supply firms, not necessarily how this labor spreads throughout the region.

Distribution jobs are more spread out across the region, but are generally concentrated in the cities of Yuba City and Sacramento (north, downtown, and southeast), with some groupings in Rocklin and Courtland. Processing is characterized by large employment concentrations in Woodland, eastern West Sacramento, central Sacramento, and Sacramento County between the cities of Sacramento and Elk Grove. Finally, the support subsector follows a similar concentration pattern to the cluster average (main concentrations in Yuba City, west of Woodland, and southeast Sacramento, plus significant groupings in Davis and central Sacramento). However, for this subsector Rancho Cordova includes one of the greatest concentrations in employment, with additional significant groupings near Live Oak, Auburn, McClellan Airfield, West Sacramento, and the community of Walnut Grove.

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[5] SACOG's Draft 2015 Employment Inventory was developed using data from the Employment Development Department. The information is in draft form, as SACOG is currently reviewing and editing the data for final release later this year. While employment estimates may change on a smaller scale, the location and total of employees at the cluster level provides useful information about employment concentration. The employment concentration maps use the spatial analyst function in GIS to calculate "densities" of employment by standard deviation from the mean to show where employment is clustered geographically.
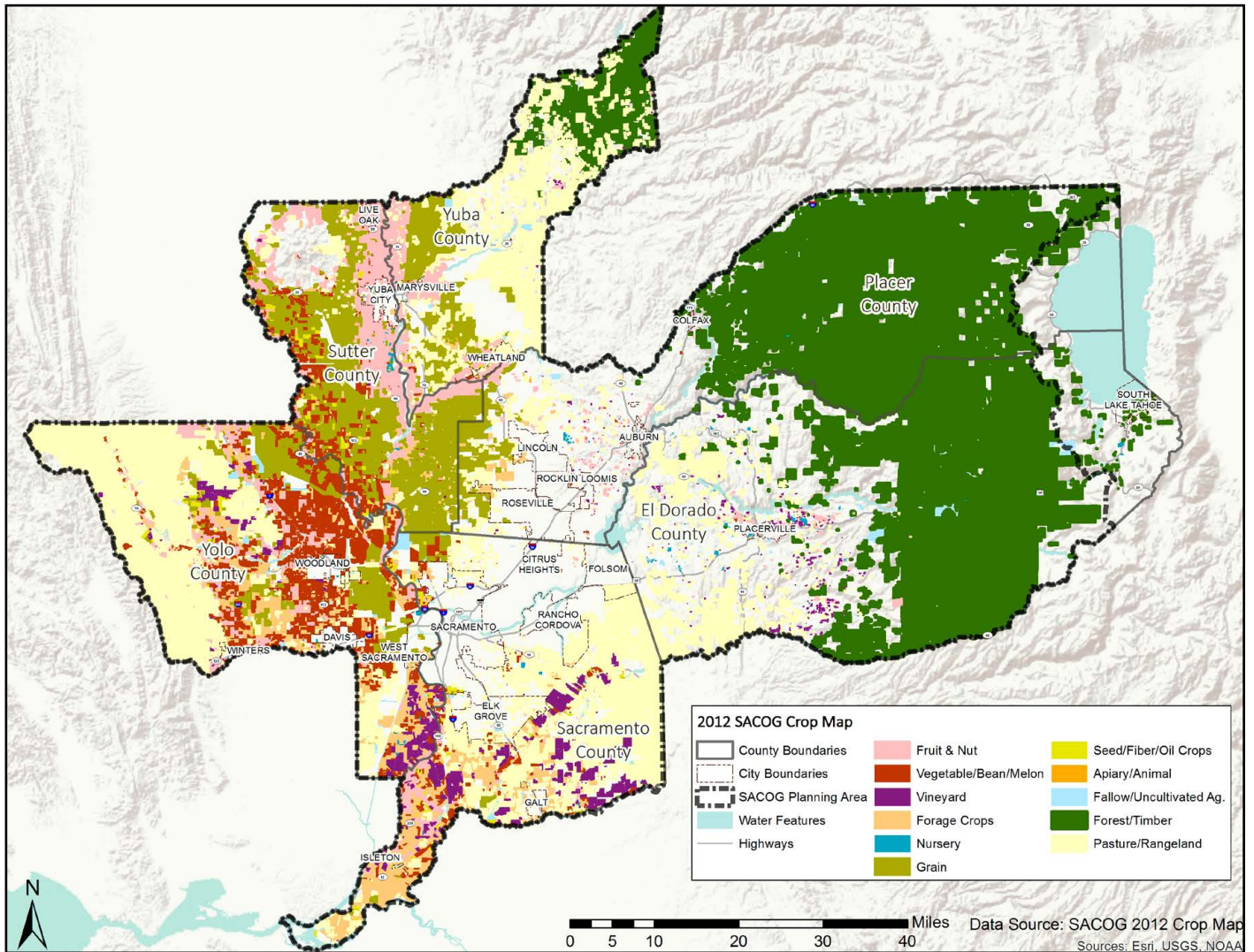
Figure 5a: Food and Agriculture Cluster Employment Concentration

Figure 5b: RUCS 2012 Crop Map

* Farm labor contractor firms in the production segment of the cluster may be incorporated in a single facility, but may supply labor to
farms across the region. The map emphasizes the physical location of farm labor supply firms, but not necessarily how this labor spreads
throughout the region. All maps show areas of particular concentration, not each subsector's full economic activity.

Figure 5c: Employment Concentration by Cluster Subsector
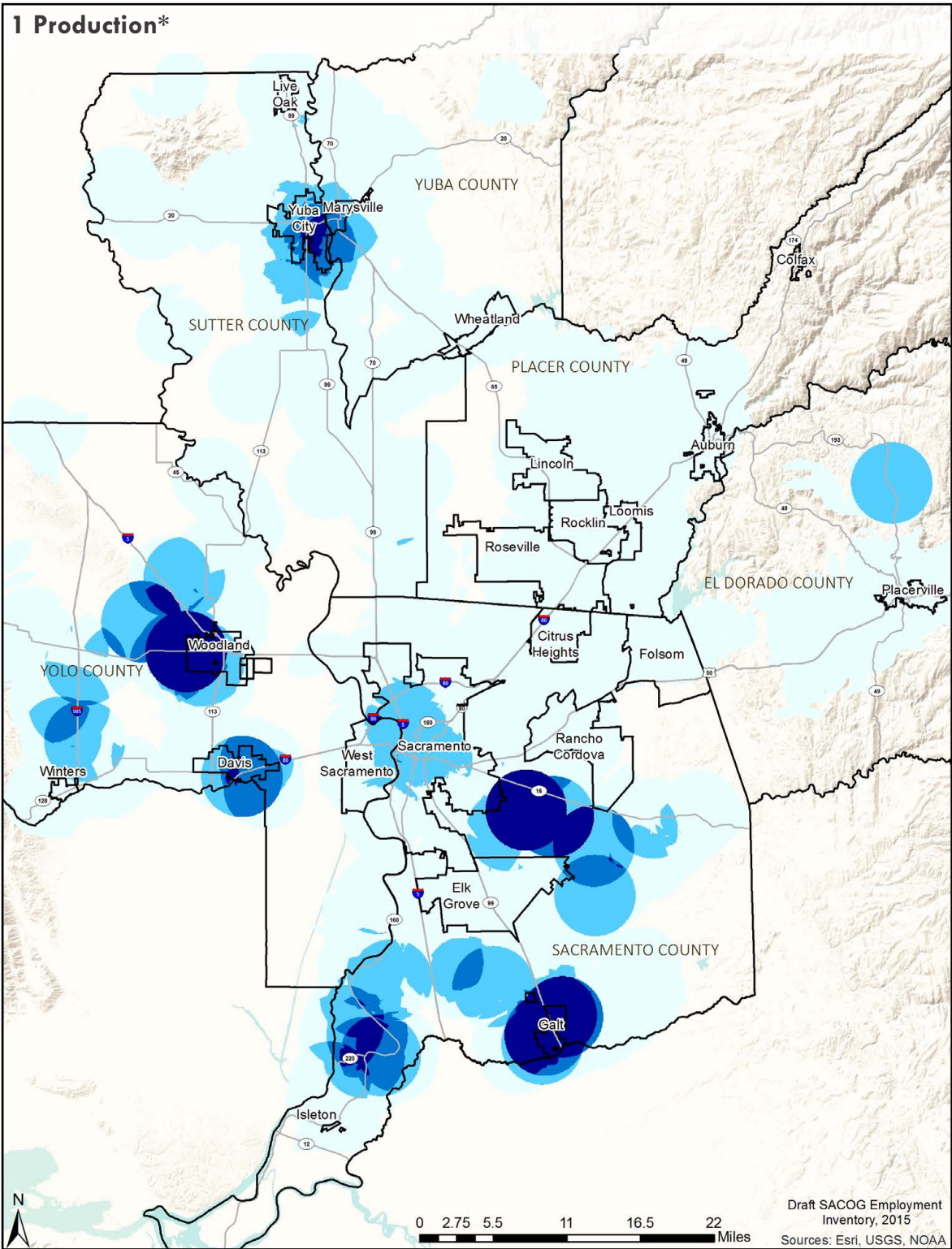
CONCENTRATION OF EMPLOYMENT: GEOGRAPHIC CONCENTRATION

Figure 5d: Employment Concentration by Cluster Subsector

Figure 5e: Employment Concentration by Cluster Subsector

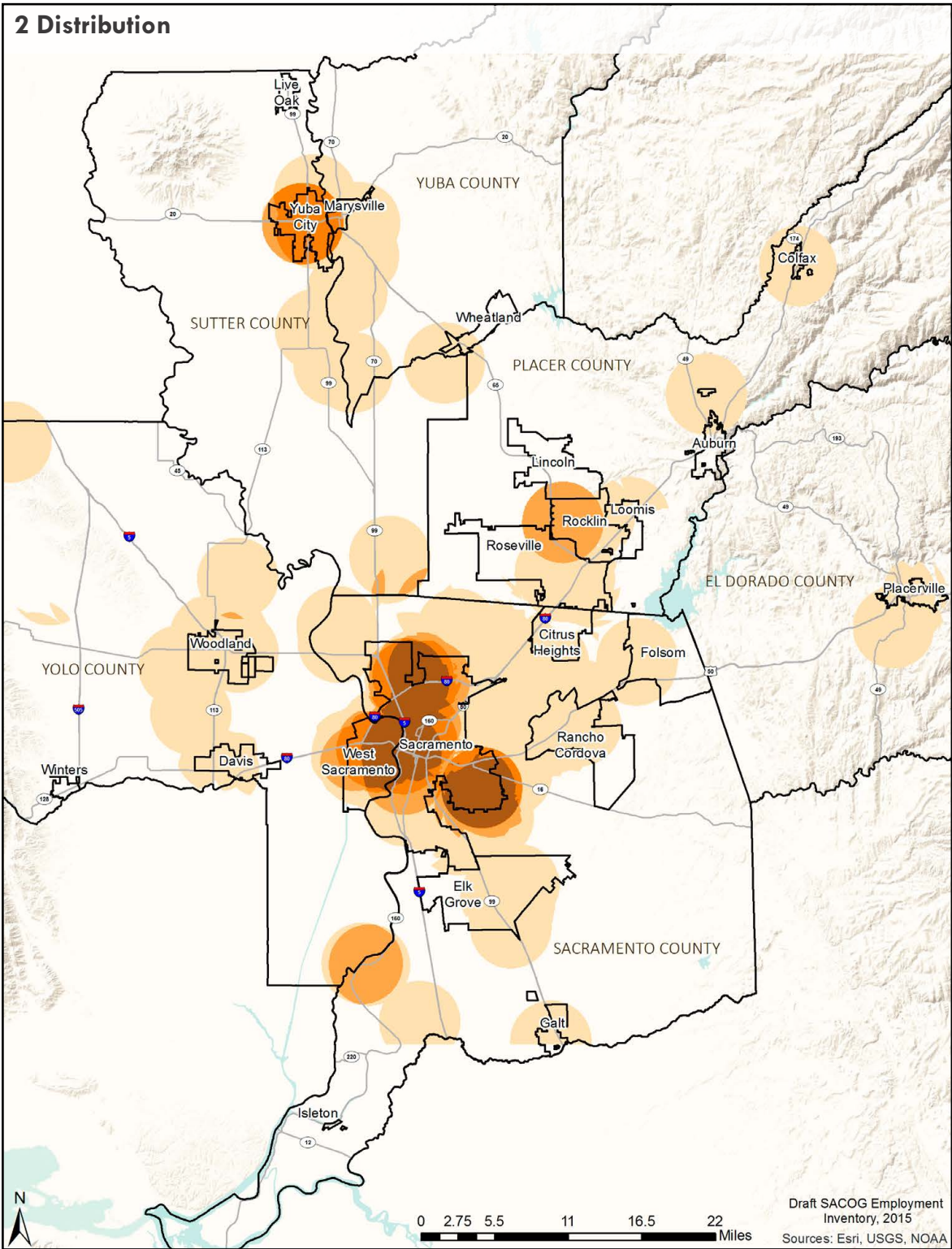# CONCENTRATION OF EMPLOYMENT: GEOGRAPHIC CONCENTRATION

Figure 5f: Employment Concentration by Cluster Subsector

ECONOMIC IMPACT
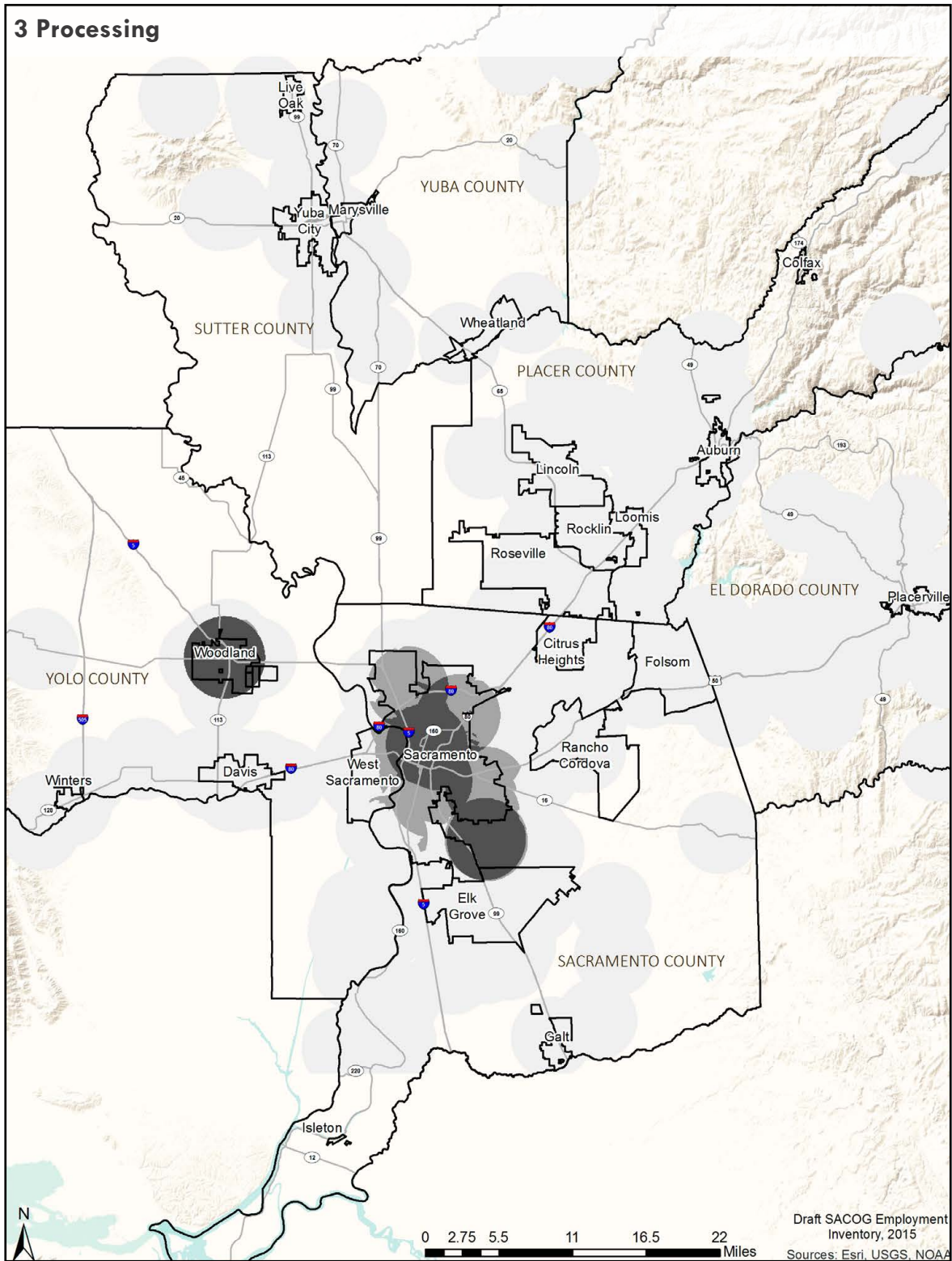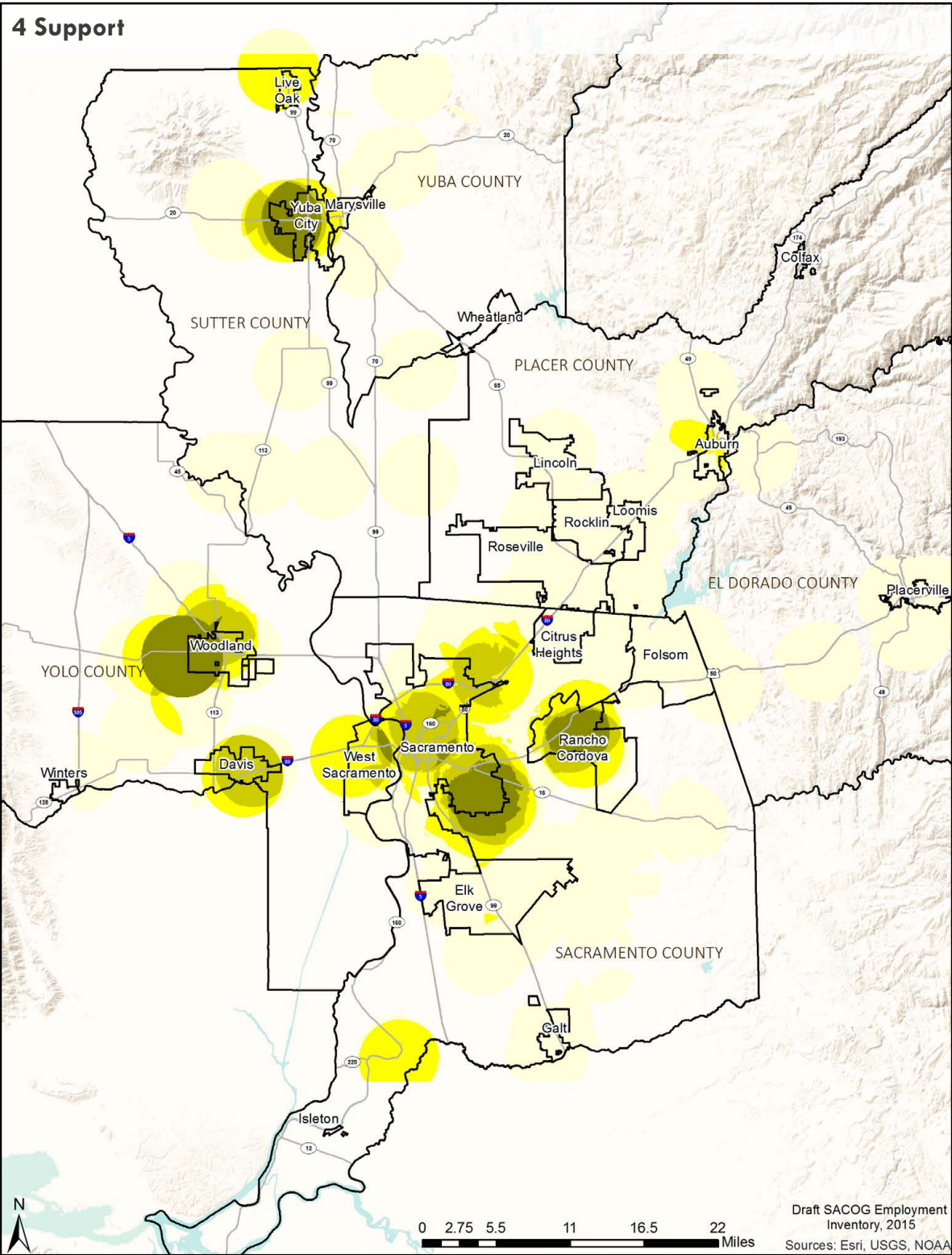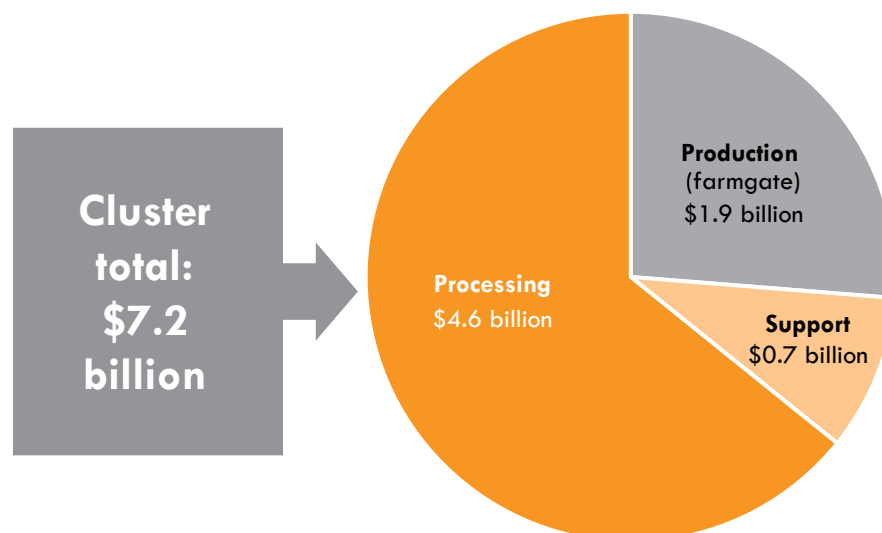
In addition to providing jobs both on and off the farm, the Food and Agriculture cluster also plays an important role in the region's overall economic output. Consistent with other Next Economy cluster updates, this report uses the IMPLAN model to measure the direct economic impacts of the Food and Agriculture cluster.

As shown in Figure 6, the Food and Agriculture cluster directly contributes over $7.2 billion[6] to the regional economy, or about 4 percent of total output in the Sacramento Capital region. However, this output total does not include the contribution of the distribution component of the cluster, due to data limitations in the base model. As such, this initial measure underestimates the full economic contribution of the cluster, but provides a starting point for comparison. Forthcoming RUCS work in the Food System Multiplier project will provide further output detail by segment, including how the cluster's overall direct economic activity leads to additional economic activity through a multiplier effect.

Of the three segments measured in the model, the processing subsector contributes the highest direct output, a total of $4.6 billion, followed by the production sector, $1.9 billion of farmgate value in 2013. (The farmgate value is the net value of the product after it leaves the farm.) The support sector estimate accounts for the smallest share of the cluster's total economic impacts at less than $1 billion. Farmgate value increased to $2.4 billion in 2014 in spite of the drought.

According to the 2012 **USDA Census of Agriculture**, the majority of the region's farms (83 percent) are smaller than 180 acres, and 64 percent of farms earn less than $25,000 per year. Larger operations with higher revenues are seen throughout the region. Yet, as with the rest of the state, our region is made up of mostly smaller family farm operations that rely heavily on off-farm income.

Figure 6: Food and Agriculture Cluster Output, 2013[7]

Cluster total: $7.2 billion

Processing $4.6 billion

Production (farmgate) $1.9 billion

Support $0.7 billion

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[6] The IMPLAN analysis uses data for the year 2013 (a year earlier than the 2014 employment and firm data).

[7] IMPLAN, 2013. The economic contribution of the distribution segment of the cluster cannot be determined from the base model.

EMPLOYMENT CHANGE

Like all areas of the economy, the Food and Agriculture cluster was heavily impacted by the recent recession. Yet, in the last several years the cluster has rebounded, adding jobs at a rate faster than the regional economy. This section of the report explores some recent trends in how the Food and Agriculture cluster has rallied from the recession to better compete locally, nationally, and globally.
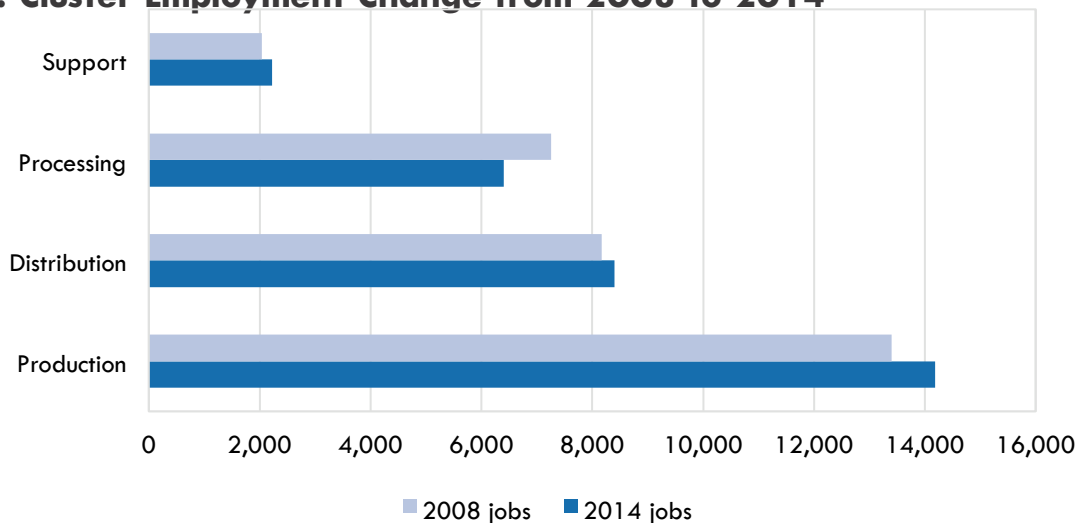
Between 2007 and 2008, the Food and Agriculture cluster lost almost 400 jobs and continued to decline until 2010 for a total loss of more than 1,100 jobs. However, unlike other clusters, by 2011 the cluster had already started to recover, adding almost 800 jobs. By 2014, employment in the cluster had returned to its pre-recession high. Indeed, while the region as a whole in 2014 still had not recovered all jobs lost in the recession, the distribution segment of the Food and Agriculture cluster increased employment by 3 percent, with a 6 percent increase in agricultural production employment and 9 percent in the support segment compared to 2008.

While the other segments of the cluster have added jobs since 2010, processing was the only sector to actually lose jobs during the previous five years, continuing a downward trend that predates the recession reflecting in part the impact of technological innovations. As processing is an important value-adding segment of the cluster, this contraction in employment is a key challenge. However, this overall trend masks some momentum for individual processing industries, such as wineries (27 percent employment growth over the last five years) or nut processing (18 percent employment growth over the last five years).

The Food and Agriculture cluster has outpaced the region at large in economic recovery.

Figure 7: Cluster Employment Change from 2008 to 2014[8]

Legend: 2008 jobs, 2014 jobs

(Horizontal axis: 0, 2,000, 4,000, 6,000, 8,000, 10,000, 12,000, 14,000, 16,000)

Categories: Support, Processing, Distribution, Production

[8] EMSI: QCEW Employees, Non-QCEW Employees, and Self-Employed, 2015.2

EMPLOYMENT CHANGE

Figure 8 below incorporates current conditions and recent trends in the cluster into a single graphic. The bubble chart compares regional employment growth from 2008 to 2014 (on the x axis of graph) to the current concentration of employment in the region (y axis), with the size of the bubble indicating the current total number of jobs for each segment of the cluster.[9] The graphic substantiates the findings of the above section. Production and processing sectors in the Sacramento Capital region have a lower concentration of employment than the statewide average, while the support and distribution segments have a higher concentration. While the support sector had the smallest overall number of jobs in 2014, it experienced the greatest increase in employment from 2008 to 2014 and had the highest concentration of employment relative to the state average. Conversely, the processing subsector had the lowest concentration of employment of any subsector and continues to lose jobs year over year.

Figure 8: Cluster Employment Change and Concentration[10]
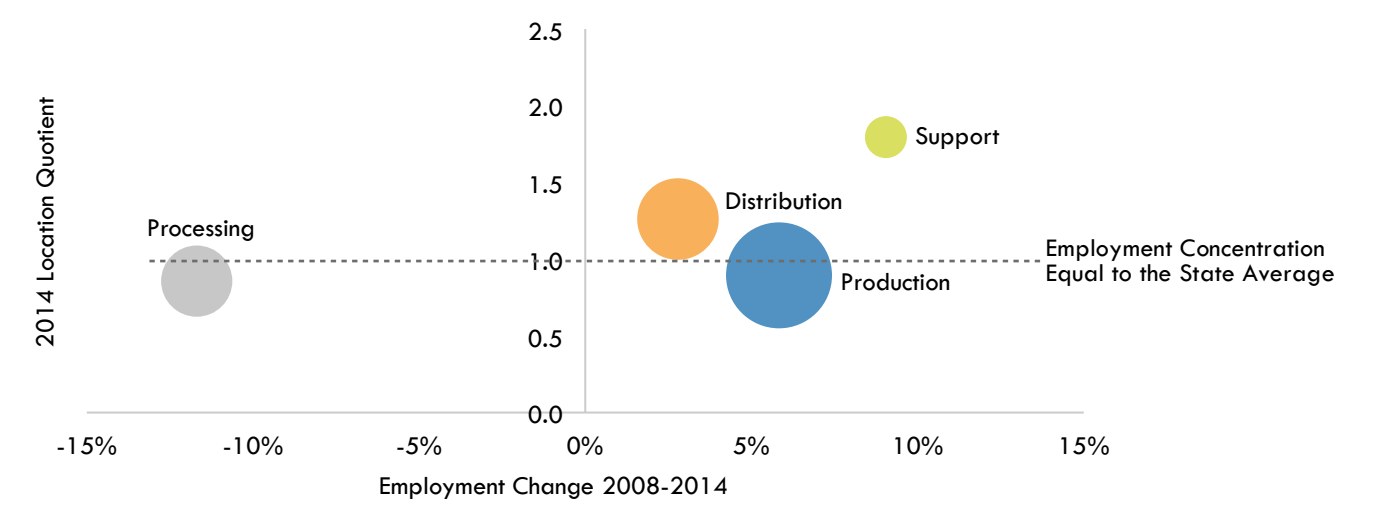
ECONOMIC IMPACT CHANGE

In the past several years, the value of regional agricultural production has soared. As shown in Figure 9, the total value of agricultural production in the SACOG region rose from $1.6 billion in 2008 to $2.4 billion[11] in 2014, an increase of 49 percent. Even when adjusted for inflation this translates to an increase of 36 percent in real dollars, far outpacing the regional economy as a whole.[12] With a substantial increase of 118 percent in total value (98 percent when adjusted for inflation), specialty crops (including vegetables, fruits, and nuts) saw an increase in value from $600 million to over $1.4 billion from 2008 to 2014. To highlight this trend, the following section compares specialty crops to all agricultural crop production, showing how specialty crops accounted for 95 percent of the growth in value between 2008 and 2014.

The **RUCS** appendix of SACOG's **MTP/SCS** demonstrates that while the value of agricultural commodities in the region had declined in near parallel with the decline in agricultural acres in past years, record commodity prices today have somewhat reversed this trend. It appears that some fallowed land has been brought back into production to take advantage of higher prices in the marketplace.

Figure 9: Value of Agricultural Output, 2008–2014[13] (in nominal dollars)[14]

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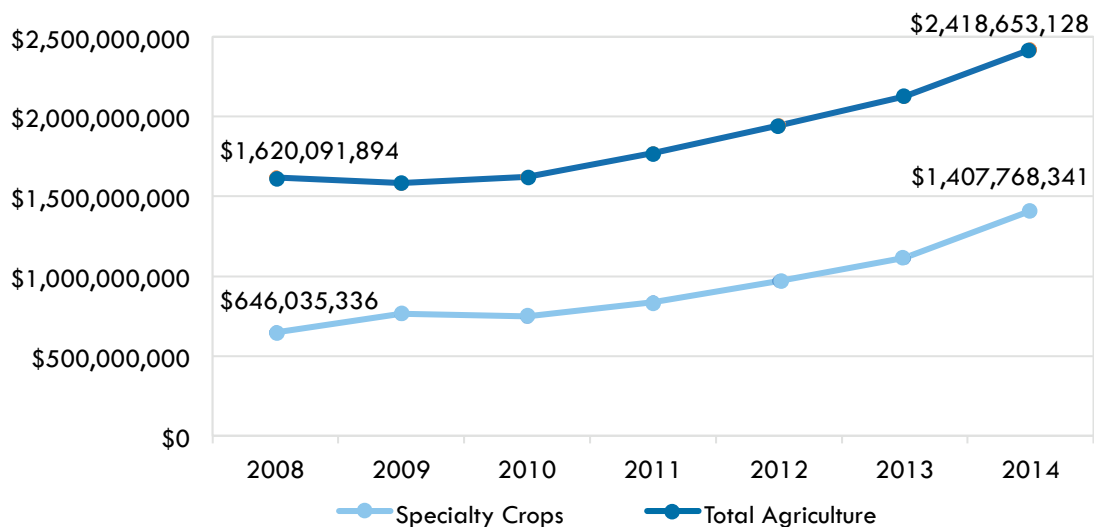
[11] Note that this $2.4 billion is for the year 2014, one year after the study's 2013 IMPLAN estimate of $1.9 billion, referenced in the economic impact section of this report.

[12] Values adjusted for inflation using the Consumer Price Index Inflation Calculator by the Bureau of Labor Statistics.

[13] *El Dorado and Alpine Counties Agricultural Crop and Livestock Report,* 2008, 2010, 2012, 2014; *Agricultural Crop Production Report for Placer County,* 2012, 2014; *Sacramento County Crop and Livestock Report,* 2008, 2010, 2012, 2014; *Sutter County Crop & Livestock Report,* 2014; *Yolo County Agricultural Crop Report,* 2008, 2011, 2014; and *Crop Report for Yuba County* 2008, 2010, 2012, 2014. The years of crop reports accessed vary among counties because some counties include more years in their past value comparisons than others.

[14] Nominal dollars are the value of the output in its given year and are not adjusted for inflation.

ECONOMIC IMPACT CHANGE

As shown in Figures 10a and 10b respectively, 63 percent of total farmgate value and 70 percent of specialty crop farmgate value in the region were generated by Sutter and Yolo counties in 2014.[15] Conversely, El Dorado and Placer counties have the lowest agricultural and specialty crop values in the region, but this total does not include timber. El Dorado, Sutter, Yolo, and Yuba counties all have a similar proportion of specialty crop value as compared to total agricultural value (ranging from 61 percent to 64 percent), while Placer County has a far lower proportion of specialty crop value at 16 percent. The proportion of total agricultural value by county was very similar from 2008 to 2014, only shifting by about 1 percent. This trend was similar for specialty crops, except for a more significant decrease in Sacramento County (-7 percent) and increase in Sutter County (+5 percent) over the same period.

Figure 10a: Total Agricultural Value, 2014[16]
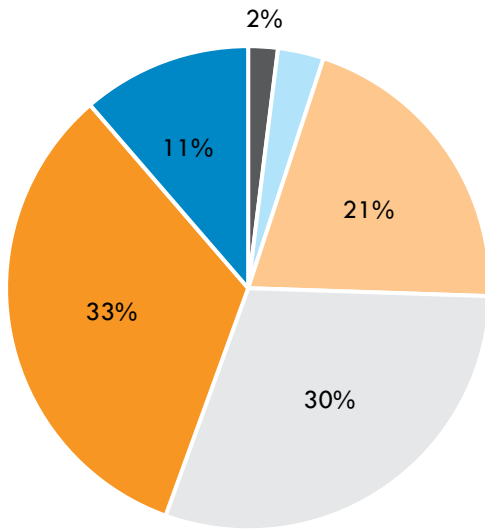
Figure 10b: Specialty Crop Value, 2014[16]
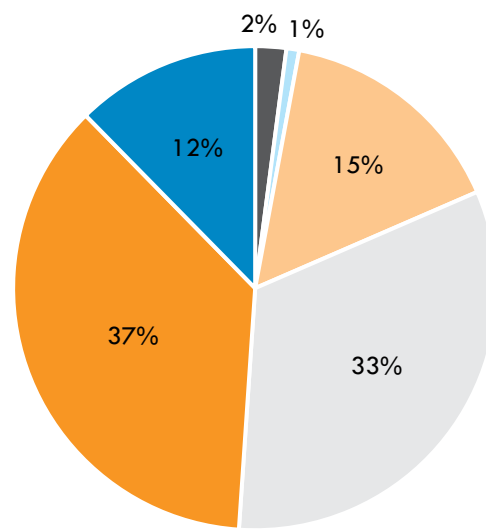
Legend: ■ El Dorado ■ Placer ■ Sacramento ■ Sutter ■ Yolo ■ Yuba

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[15] While county agriculture reports generally categorize crop and livestock yields in a similar fashion, there is some variation in the type of crops rolled up into a given category which makes it difficult to truly normalize the reports for comparison across counties. Within this dataset these discrepancies occur in El Dorado County where the report includes data from Alpine County, Yolo County which includes an organic category encompassing some non-specialty crops, and Yuba County which includes some miscellaneous field crops in a vegetable crop category. However, these differences are minor overall, and the data still provides useful county comparisons.

[16] *El Dorado and Alpine Counties Agricultural Crop and Livestock Report,* 2008, 2010, 2012, 2014; *Agricultural Crop Production Report for Placer County,* 2012, 2014; *Sacramento County Crop and Livestock Report,* 2008, 2010, 2012, 2014; *Sutter County Crop & Livestock Report,* 2014; *Yolo County Agricultural Crop Report,* 2008, 2011, 2014; and *Crop Report for Yuba County* 2008, 2010, 2012, 2014. The years of crop reports accessed vary among counties because some counties include more years in their past value comparisons than others.

ECONOMIC IMPACT CHANGE
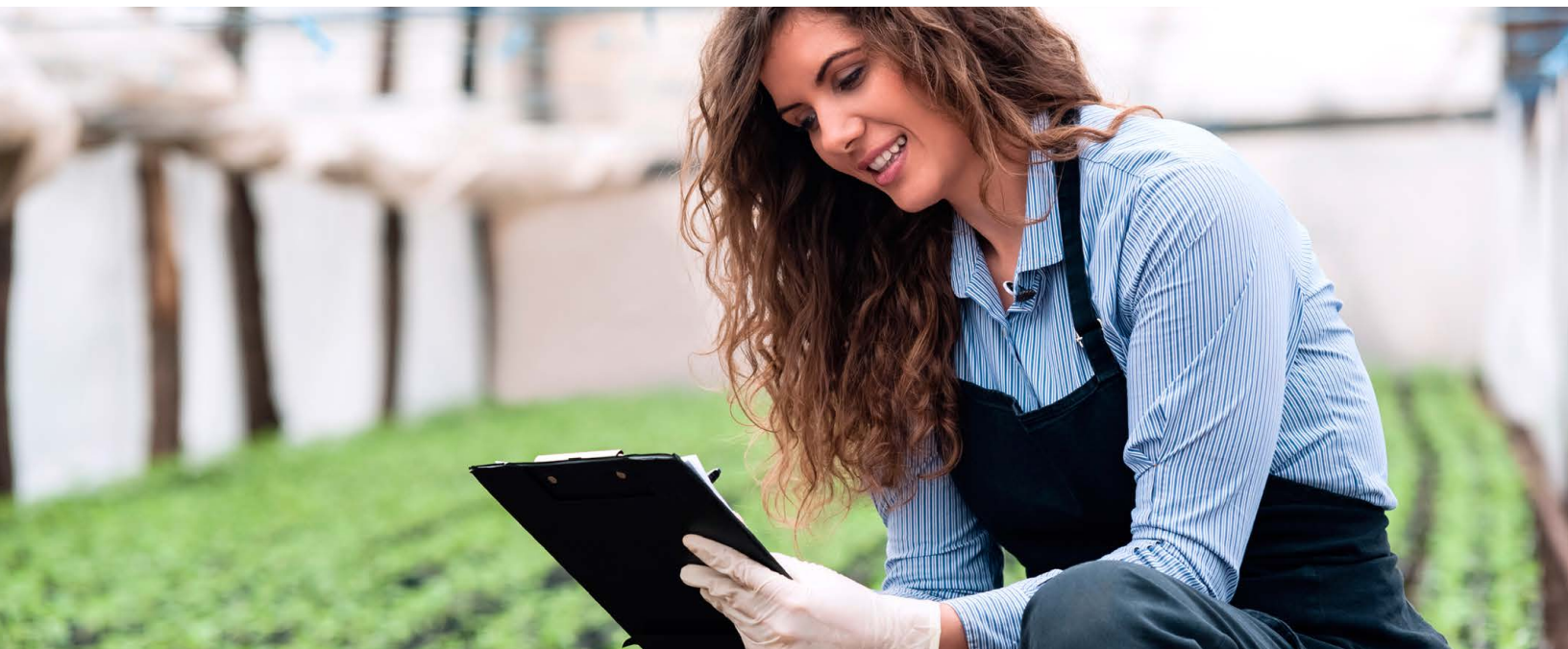
Within the region, specialty crops generated about three times the value per acre in 2012 compared to other agricultural products (Figure 11). Specialty crops in all counties generated a higher value per acre than non-specialty crops, although the difference was most pronounced in El Dorado (factor of 22) and Yuba (factor of 7) counties and least evident in Placer (factor of 1.34) and Sutter (factor of 1.66) counties. Sacramento County had the highest specialty crop value per acre ($3,728), while Placer County had the lowest ($1,832).

Figure 11: Agricultural Value per Acre[17]
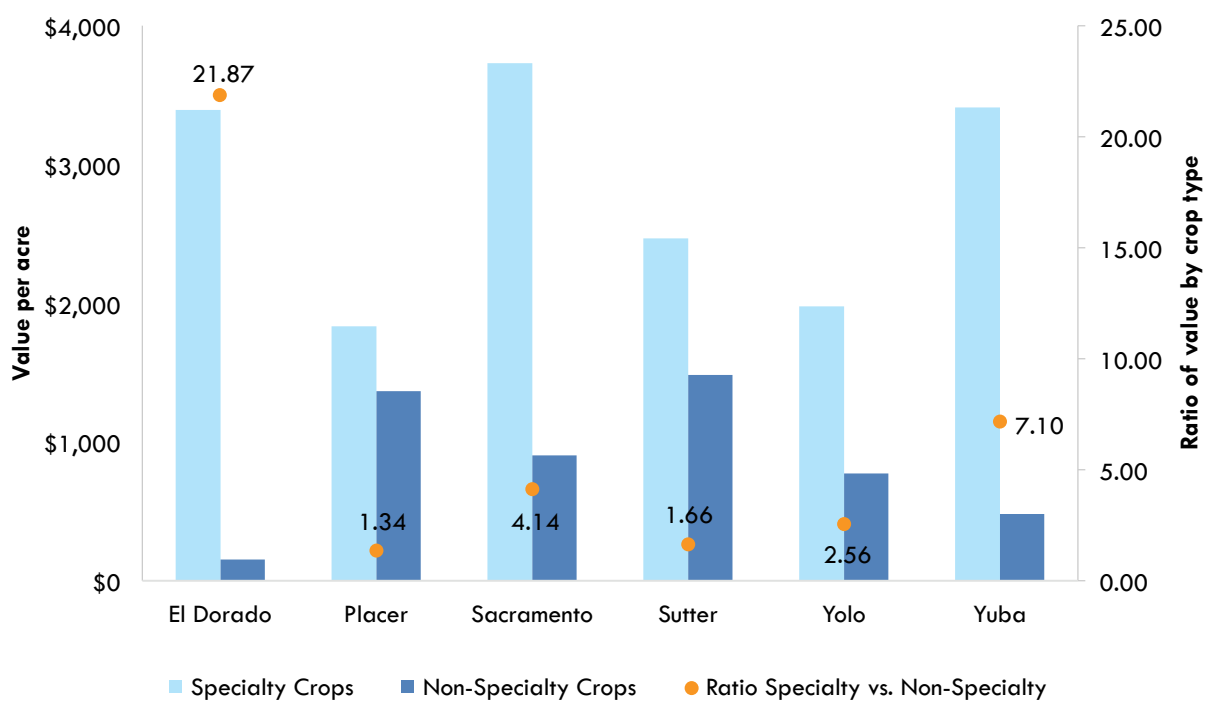
EMPLOYMENT TRENDS AND PROJECTIONS

This section uses employment projection estimates from EMSI to look out five years from the study base year of 2014, providing consistency with other Sacramento Capital region workforce reports. These estimates provide one possible indicator of future conditions if current trend lines continue. Yet, it is also important to recognize our potential to change this trajectory through the proactive strategies contained in the Food and Agriculture cluster action plan. The following section illustrates some other potential future outcomes in the cluster drawing on RUCS cases studies, food hub financial analyses, and other regional food economy initiatives including the Central Valley Ag Plus Food and Beverage Manufacturing Consortium managed by Valley Vision.

As shown in Figure 12, after a forecasted loss in employment of about 350 jobs between 2014 and 2015, the EMSI estimates project the cluster to recover and add an additional 700 jobs by 2019. By 2019, the region is expected to include 145 more jobs than the high in 2012.

Figure 12: Employment Trends and Projections, 2008–2019[18]
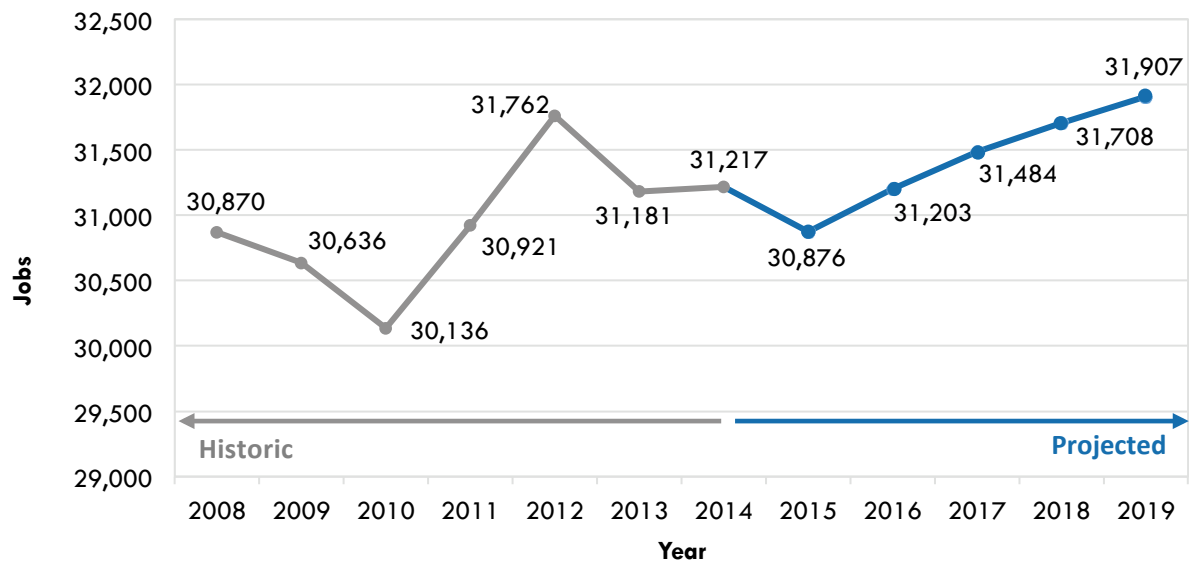
As shown in Table 1, the distribution subsector is projected to add both the greatest number and proportion of jobs (927 jobs, 11 percent), followed by the support subsector (203 jobs, 9 percent). The processing subsector is expected to experience job loss over the next five years, totaling more than 500 jobs (8 percent).

Table 1: Employment Projections by Subsector, 2014–2019[18]

Food and Agriculture Subsector	2014 Jobs	2019 Jobs	# Change	% Change
Production	14,187	14,251	64	<1%
Distribution	8,402	9,329	927	11%
Processing	6,407	5,902	-504	-8%
Support	2,222	2,425	203	9%
Total Cluster Jobs	**31,217**	**31,907**	**690**	**2%**

[18] EMSI: QCEW Employees, Non-QCEW Employees, and Self-Employed, 2015.2

ALTERNATIVE CLUSTER TRAJECTORIES: RUCS CASE STUDY

Emerging market opportunities coupled with the convening, priority setting, and strategy development that will result in the Food and Agriculture cluster workforce action plan for the Sacramento Capital region (among other efforts) have the potential to dramatically change the trajectory of this vital cluster into the future. Through its scenar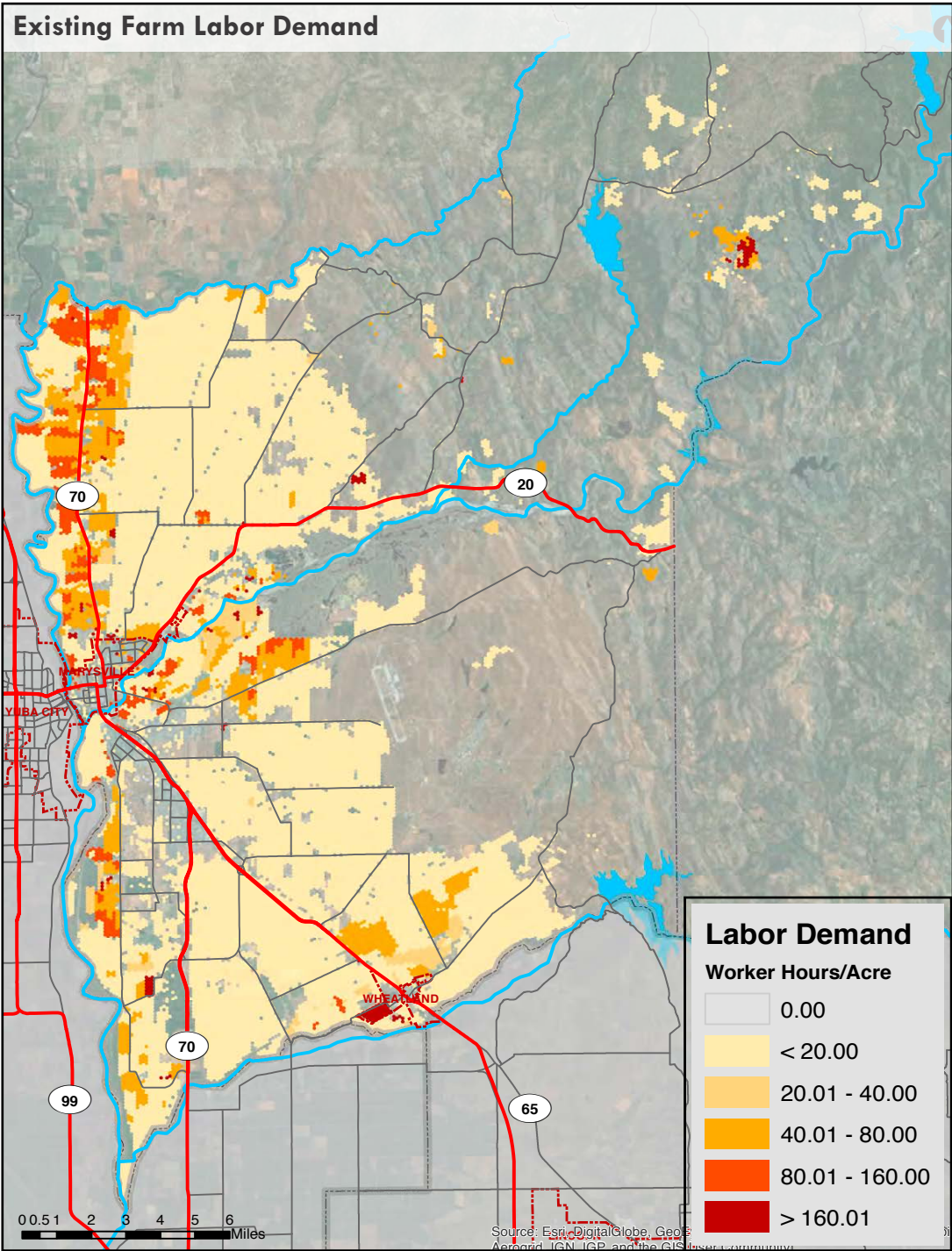io planning efforts, RUCS has developed a suite of tools and models to test a range of changes in market demand and cost of production, illustrating alternative possible futures in the cluster that respond differently to market changes and supportive strategies. These scenarios model an increase in crop and value-adding activities that meet the rapidly increasing demand for locally grown food (including that at regional institutions such as schools, hospitals, or even the Sacramento Kings arena) to show how emerging market opportunities will result in employment, not only in the production component of the cluster, but across the entire supply chain. The Farm-to-Fork movement is also increasing demand.

One area of focus for RUCS has been on ways to internalize more of our food system, in turn reducing economic leakage out of the region. In particular, these scenarios test burgeoning local market opportunities that respond to consumer demand while offering growers a means to diversify. For example, one scenario conducted in a case study for Yuba County analyzed the effects of a major cropping pattern shift to specialty crops geared to local consumption. While the scenario represents an extreme boundary-setting example of possible future change, the subsequent mapping of its results show the potential for sustained economic return and food cluster employment opportunities as smaller shifts occur in the food system. Notably, the modeled scenario quadrupled overall production value in the study area, along with an increase in labor demand (and thus job opportunities). Other scenarios—such as those conducted in RUCS' Sacramento Regional Agricultural Infrastructure Project—exhibit the potential to reverse the downward employment trend in regional processing through investments in mid-scale facilities, such as food hubs.

While the RUCS scenarios help demonstrate opportunities for agricultural-based economic development, they also showcase the need for the region to respond to key challenges that, if unaddressed, would inhibit future growth potential. Notably, to activate any of the economic opportunities illustrated through scenario planning requires—among other efforts—a sufficiently aligned workforce. This challenge is particularly relevant for a regional production sector that faces a constrained labor supply.

ALTERNATIVE CLUSTER TRAJECTORIES: RUCS CASE STUDY

Figure 13a: Yuba County Case Study Scenarios

Existing Farm Labor Demand

Labor Demand
Worker Hours/Acre

	0.00
	< 20.00
	20.01 - 40.00
	40.01 - 80.00
	80.01 - 160.00
	> 160.01

Figure 13b: Yuba County Case Study Scenarios

Local Market Scenario Farm Labor Demand

Labor Demand
Worker Hours/Acre

	0.00
	< 20.00
	20.01 - 40.00
	40.01 - 80.00
	80.01 - 160.00
	> 160.01

Source: Esri, DigitalGlobe, GeoEye, Aerogrid, IGN, IGP, and the GIS User Community
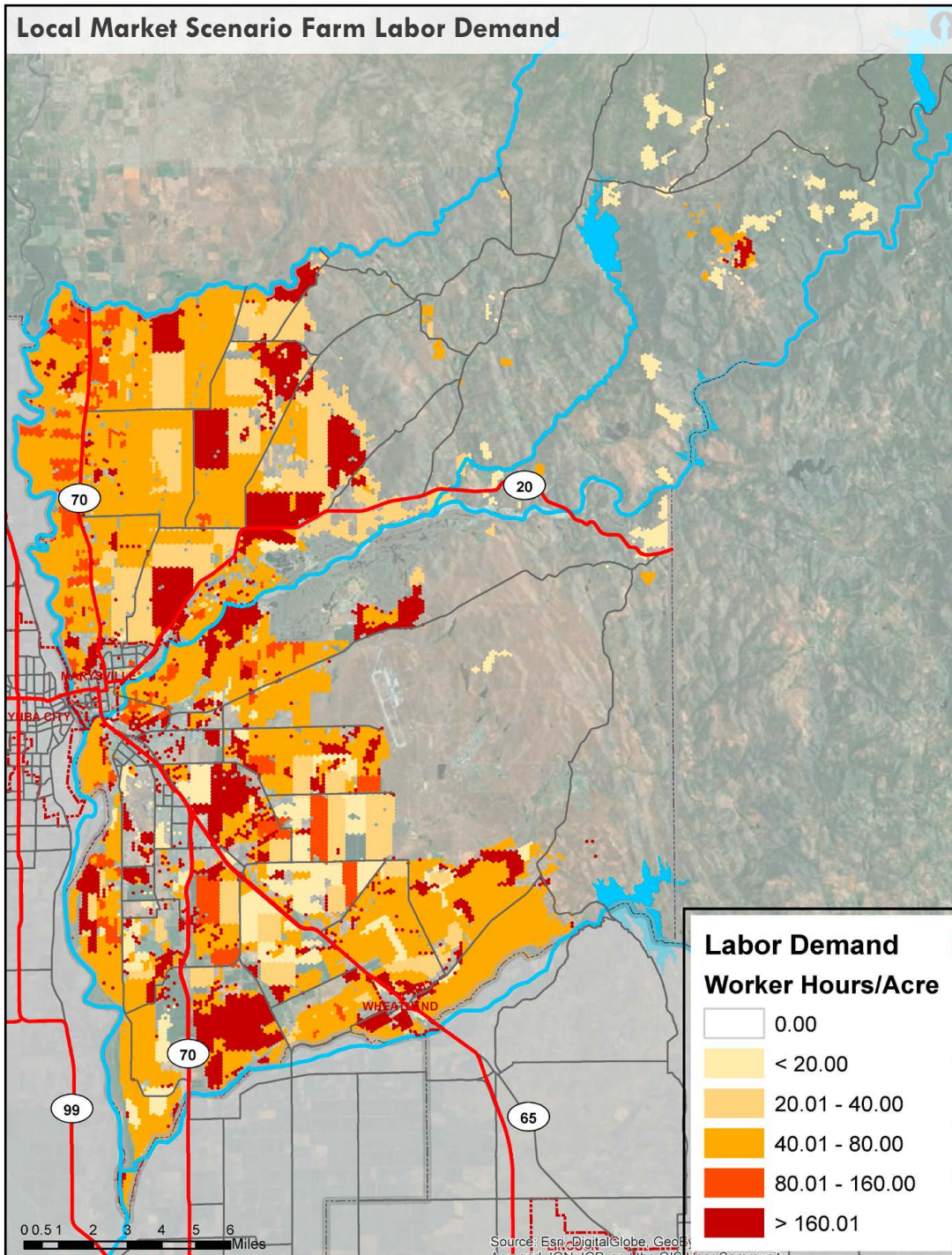
Figure 13a and 13b measures the estimated increase in farm labor from a possible future scenario capitalizing on the increasing demand for local food, and Figure 13c and 13d estimates grower return from the same scenario. Together these RUCS scenarios illustrate market opportunities that augment economic return and lead to more employment opportunities in the Food and Agriculture cluster. Regional partners are acting to address key challenges to better capitalize on these opportunities, including the development of cluster-based workforce action plans.

Figure 13c: Yuba County Case Study Scenarios

Basecase Estimated Farm Return on Investment

ROI
(Return on Investment)

🟥	< -5.00%
🟧	-4.99% - -00.01%
🟨	0%
🟩	00.01% - 10.00%
🟩	10.01% - 25.00%
🟩	> 25.01%

Source: Esri, DigitalGlobe, GeoEye, Aerogrid, IGN, IGP, and the GIS User Community
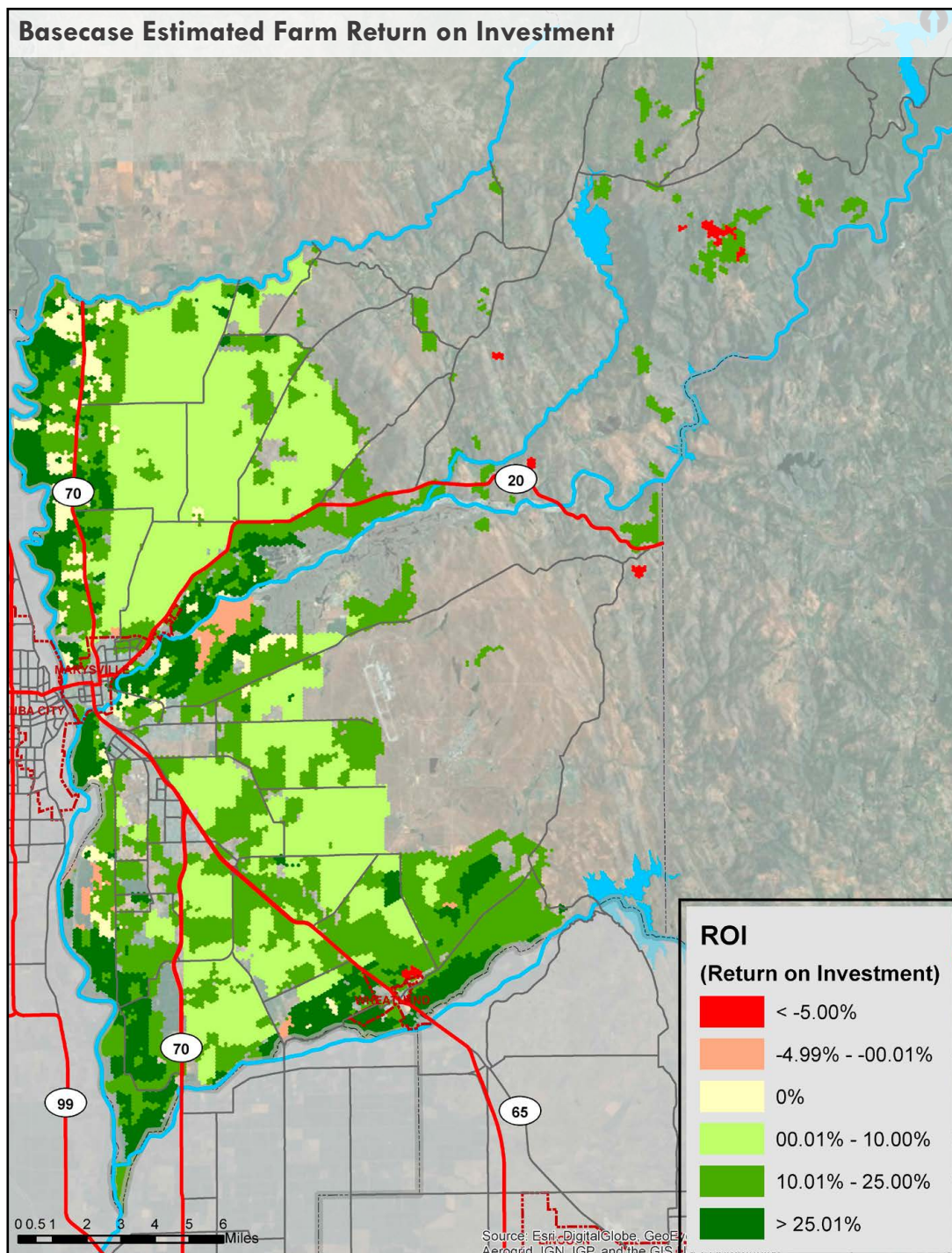
ALTERNATIVE CLUSTER TRAJECTORIES: RUCS CASE STUDY

Figure 13d: Yuba County Case Study Scenarios

Local Market Scenario Farm Return on Investment

ROI
(Return on Investment)

- < -5.00%
- -4.99% - -00.01%
- 0%
- 00.01% - 10.00%
- 10.01% - 25.00%
- > 25.01%
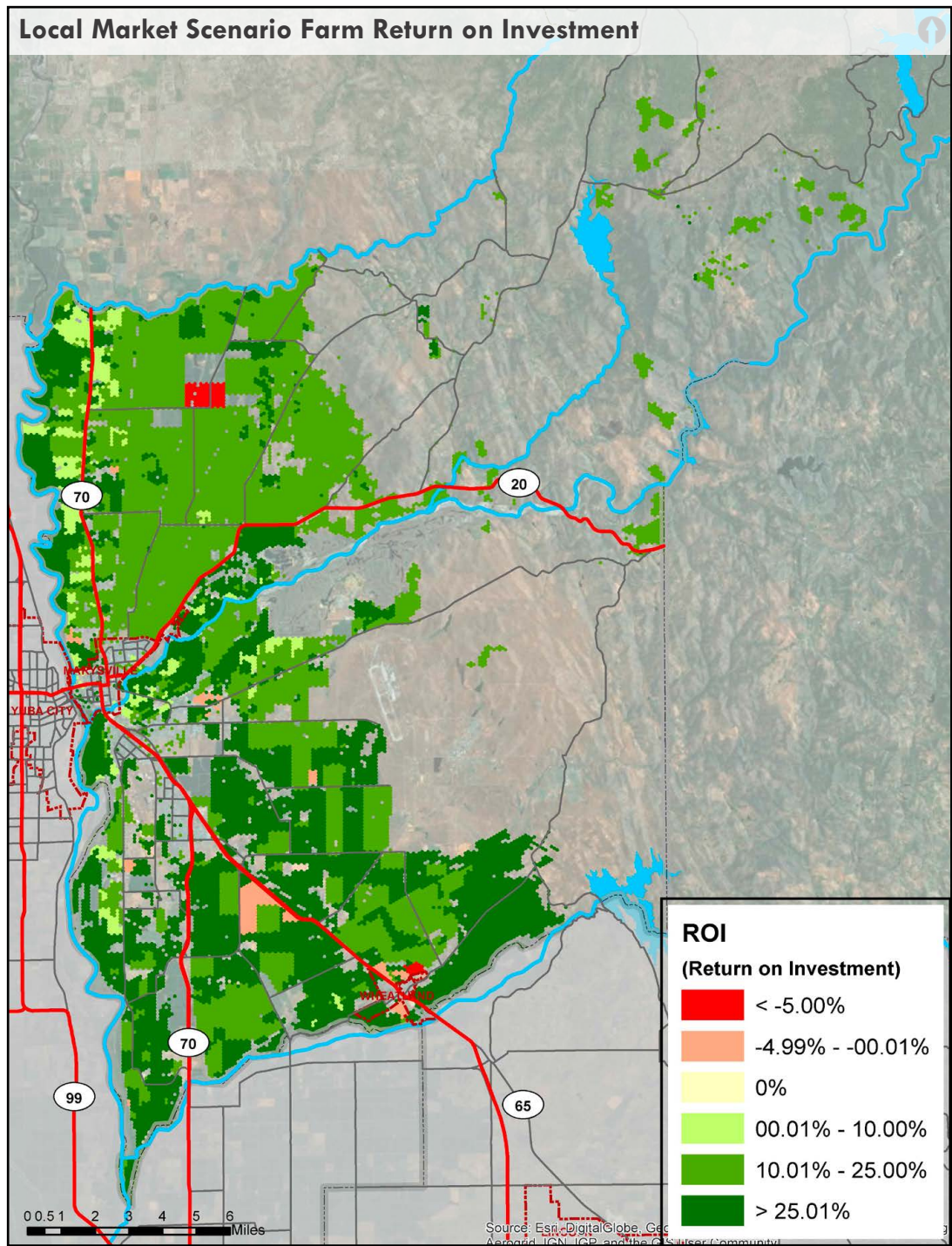
OCCUPATION DEMAND

Ten occupations were selected for inclusion in the study based on the following criteria:

- Annual job openings were significant.
- The minimum education requirement is a high school diploma plus on-the-job training, postsecondary award, associate degree, or bachelor's degree.

Table 2 displays the employment demand for the Agriculture and Food cluster occupations selected for inclusion in this study. Five of these occupations are employed primarily by the cluster, while the other five are employed throughout the economy. Over the next five years (2015–2020), these occupations are projected to grow by 8%, adding nearly 2,400 new jobs and 3,000 replacement jobs for total openings of almost 5,400 jobs. Heavy and tractor-trailer truck drivers is the largest occupation with the most annual openings, followed by maintenance and repair workers. For the occupations specific to the cluster, soil and plant scientists is largest with the most annual openings, followed by farmers and ranchers.

Table 2: Occupational Employment Outlook, Agriculture and Food Cluster, Sacramento Capital Region[19]

Description	2015 Jobs	2020 Jobs	2015–2020 Change	2015–2020 % Change	Total Replacements	Total Openings	Annual Openings
Heavy and Tractor-Trailer Truck Drivers	10,694	11,934	1,240	12%	924	2,164	433
Maintenance and Repair Workers, General	7,694	8,159	465	6%	806	1,271	254
Market Research Analysts and Marketing Specialists	2,798	3,245	447	16%	212	659	132
Sales Managers	3,130	3,244	114	4%	345	459	92
Industrial Machinery Mechanics	1,176	1,286	110	9%	183	293	59
Soil and Plant Scientists	593	629	36	6%	102	138	28
Farmers, Ranchers, and Other Agricultural Managers	1,446	1,376	(70)	(5%)	192	122	24
Agricultural and Food Science Technicians	530	543	13	2%	99	112	22
Farm Equipment Mechanics and Service Technicians	320	326	6	2%	58	64	13
Food Scientists and Technologists	265	280	15	6%	47	62	12
Total	**28,647**	**31,022**	**2,376**	**8%**	**2,967**	**5,343**	**1,069**

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[19] EMSI: QCEW Employees, Non-QCEW Employees, and Self-Employed, 2016.1

In addition to industry analysis, location quotients also can be applied to occupations. In this case, the location quotient compares an occupation's total employment in the region relative to the state's total employment for that occupation. A location quotient of less than 1 indicates a lower concentration of employment for that occupation in the region than in the state overall. A location quotient of more than 1 indicates a higher concentration of employment for the occupation than in the state overall.

The bubble chart below (Figure 14) compares the concentration of occupation employment to the projected five-year growth rate in the region, where the size of the bubble indicates the total number of jobs for each occupation. As shown below, three of the 10 occupations—soil/plant scientists, food science techs, and food scientists—have a high concentration of employment, but few jobs and moderate projected growth. The largest occupation—heavy and tractor-trailer truck drivers—has an average concentration of employment in the region, but strong projected growth.

Figure 14: Growth Rate vs. Occupational Concentration, Food and Agriculture Cluster, Sacramento Capital Region[20]
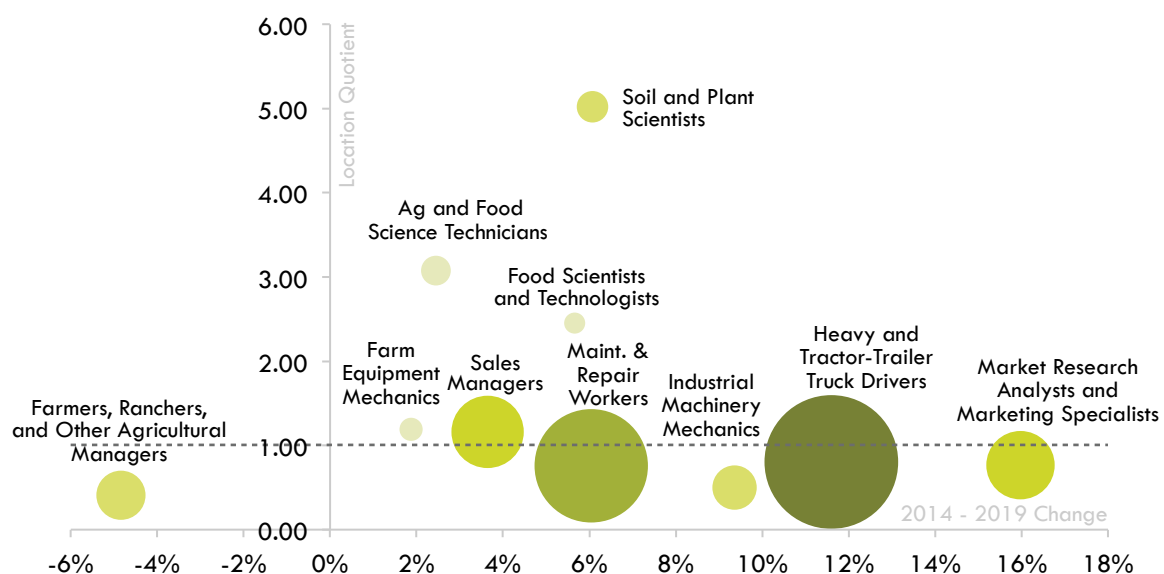
OCCUPATION WAGES

The majority of occupations in the Food and Agriculture cluster earn wages that are close to or above the regional median wage. Sales managers is the highest paid occupation, followed by marketing specialists and soil/plant scientists. The lowest paid occupations in the group include truck drivers and food science technicians. However, with the appropriate education and training, food science technicians may advance to food scientist positions and earn wages above the regional average. The median hourly wage across all occupations in the Sacramento Capital region is $22.69 per hour.

Figure 15: Hourly Wages, Food and Agriculture Occupations, Sacramento Capital Region

Median Hourly Wage, All Occupations

Occupation	Pct. 75 Hourly Earnings	Median Hourly Earnings	Pct. 25 Hourly Earnings
Sales Managers	$69.22	$46.05	$29.65
Market Research Analysts and Marketing Specialists	$40.88	$31.43	$23.47
Soil and Plant Scientists	$42.72	$30.33	$25.97
Industrial Machinery Mechanics	$33.98	$29.00	$22.05
Food Scientists and Technologists	$34.19	$25.31	$21.53
Farmers, Ranchers, and Other Agricultural Managers	$27.50	$22.77	$18.20
Farm Equipment Mechanics and Service Technicians	$28.08	$22.77	$17.33
Maintenance and Repair Workers, General	$25.10	$18.53	$14.36
Heavy and Tractor-Trailer Truck Drivers	$21.74	$18.21	$15.63
Agricultural and Food Science Technicians	$18.59	$15.45	$11.69

EDUCATION ASSESSMENT

This section provides a review of the training and education supply programs supporting the Food and Agriculture cluster for the occupations selected for inclusion in this study. Minimum education requirements are assigned to three categories:

- **Entry-level occupations** require a high school degree plus long-term on-the-job training. In this category, employers may prefer applicants if they have a formal education, such as a certificate or degree.

- **Mid-level occupations** require postsecondary training, certificate, or associate degree.

- **Advanced-level occupations** require a bachelor's degree. Some of these positions require related work experience in order to qualify for an open position.

Exhibit 16: Minimum Education Requirements

Entry-level
- Farmers, Ranchers, and Other Agricultural Managers
- Farm Equipment Mechanics and Service Technicians
- Industrial Machinery Mechanics
- Maintenance and Repair Workers, General

Mid-level
- Agricultural and Food Science Technicians
- Heavy and Tractor-Trailer Truck Drivers

Advanced-level
- Food Scientists and Technologists
- Soil and Plant Scientists
- Market Research Analysts and Marketing Specialists
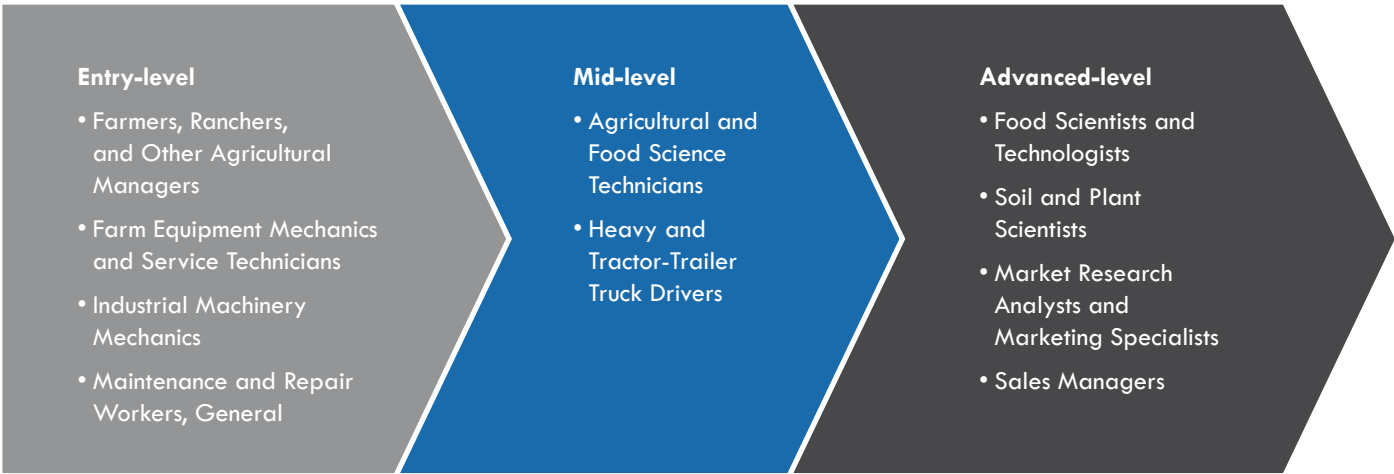- Sales Managers

Table 3 displays the number of degrees conferred by educational program in the Sacramento Capital region. As shown, there are several programs providing a pipeline of skilled and qualified applicants for nearly all of the occupations selected for inclusion in this study. Based on an assessment between the supply (average number of degrees conferred annually) and the projected demand (number of job openings), the region is likely to experience the following:

- Significant shortage of industrial machinery mechanics since the demand is significantly outpacing average number of degrees conferred.

- Moderate shortage of farm equipment mechanics and service technicians. Because the demand is too small to justify investing resources in a new training program, local employers should consider partnering and recruiting graduates from the agriculture power equipment technology programs located at Butte College and Modesto Junior College.

- Competition for food technician/scientist graduates, since there is a statewide shortage for qualified graduates entering the field.

The data also suggests an oversupply of graduates for open farming and soil/plant science positions. More information is needed to assess if there is an oversupply, such as employer education preferences, graduate goals, migration trends, worker preparedness, and completion duplication. Many of the agriculture related degrees are conferred by UC Davis, and as students are drawn from outside the region, the perceived oversupply may be overstated.

Table 3: Educational Programs & Awards, Food and Agriculture Occupations, Sacramento Capital Region[21&22]

Educational Program	3-Year Average Certificate /Degrees Conferred	Number of Training Programs
Animal Science	1	1
Horticulture	21	4
Agriculture Business, Sales & Services	3	2
Nursery Technology	12	2
Agriculture Technology and Sciences	16	4
Equine Science	58	2
Agriculture, Agriculture Operations & Related Sciences	448	2
Agriculture Business & Management, General	2	1
Food Science	74	1
Plant and Soil Science	68	1
Mechatronics Technology	13	1
Truck and Bus Driver/Commercial Vehicle Operator	Not Available	Not Available
Marketing and Distribution	27	6
Business Administration, Marketing Concentration	Not Available	1
Total	**743**	**28**

[21] California Community College Chancellor's Office Data Mart. National Center for Education Statistics (NCES). Higher education institutions are required to report completion data to NCES if they participate in any federal financial assistance program authorized by Title IV of the Higher Education Act. Completion data not reported to the NCES or CCCCO Data Mart were not included in the estimate.

[22] The 3-year average is based on academic years 2011–12, 2012–13, and 2013–14 for private education institutions and public four-year universities and 2012–13, 2013–14, and 2014–15 for community colleges.

SKILLS ASSESSMENT

Table 4 displays the top skills and professional credentials for occupations in the Food and Agriculture cluster. The data is based on analysis of job posting data, aggregated by Burning Glass. This online tool uses intelligent "spidering" to search the Internet for job listings, removes duplication, and aggregates the data into a search database. As shown, most of the skills/knowledge areas are specialized and require specific training and certifications.

Table 4: Skill and Professional Credential Preferences, Food and Agriculture Occupations[23]

Occupation	Top Skill/Knowledge Areas	Top Certifications/ Professional Credentials
Agricultural and Food Science Technicians	Food safety, food science, and inspection	Hazard Analysis and Critical Control Point (HACCP)
Farm Equipment Mechanics and Service Technicians	Equipment repair, schematic diagrams, welding, inspection and forklift operation	None listed
Farmers, Ranchers, and Other Agricultural Managers	Irrigation, biology, repair, scheduling, spreadsheets, farm management, data collection, budgeting, and supervisory skills.	None listed
Food Scientists and Technologists	Food science, product development, food safety, chemistry, experiments, biology, microbiology, labeling and packaging.	Certified Professional Food Safety
Heavy and Tractor-Trailer Truck Drivers	Inspection, commercial driving, HAZMAT, forklift operation, pre- and post-trip inspections, customer service, and repair	Commercial Driver's License
Industrial Machinery Mechanics	Repair, welding, machinery, inspection, schematic diagrams, programmable logic controller programming, and forklift operations	None listed
Maintenance and Repair Workers, General	Repair, plumbing, inspection, HVAC, painting, cleaning, carpentry, customer service, scheduling, and machinery	Environmental Protection Agency Certification
Market Research Analysts and Marketing Specialists	Marketing, social media, project management, budgeting, digital marketing, Adobe Photoshop, market research, building relationships, Facebook, customer service, marketing strategy, and email marketing	None listed
Sales Managers	Sales management, sales, building relationships, business development, budgeting, sales goals, customer service, business planning, prospecting, project management, and supervisory skills	None listed
Soil and Plant Scientists	Botany, agronomy	Non listed

[23] Burning Glass, 2016.

CONCLUSION

The Food and Agriculture cluster has deep roots in the region's history and will be an essential component of the region's future. California is the fourth largest agricultural economy in the world, and the Sacramento Capital region is a vital part of that economy, with some of the most productive farmland on earth. In addition to productive farmland, the Sacramento Capital region boasts an unrivaled array of food system assets, including multi-generational farming and ranching knowhow, world-renowned agricultural institutions such as UC Davis, food entrepreneurs, favorable climate and water supply, and engaged policymakers, to name a few.

This cluster analysis in turn illustrates how these elements fit within the overall regional economy: the measured components of the cluster account for more than 30,000 jobs spread throughout the region and over $7.5 billion in direct value. While production is the largest subsector in the cluster, there is also significant "off farm" employment (55 percent) in distribution, processing, and support. Recent employment and output trends suggest strong regional competitive advantages in the cluster. Indeed, the cluster has outpaced the overall regional economy in its recovery from the recession. The Food and Agriculture cluster analysis provides the following insight into opportunities for the regional economy:

- The region contains a significantly greater proportion of support employment compared to the state as a whole. Of all components of the cluster, the support subsector experienced the most job growth (as a percentage) between 2008 and 2014.

- The distribution subsector has a higher concentration of employment compared to the state as a whole and is projected to add the greatest number and proportion of jobs by 2019.

CONCLUSION

Specialty crops have driven the region's agricultural production sector to record levels of economic output. Indeed, the value of the food and fiber produced by the region's farms and ranches grew by over a third in inflation-adjusted dollars since 2008 to reach an all-time high in 2014. In addition to highlighting regional strengths, the Food and Agriculture cluster analysis provides further insight into where challenges exist for the regional economy:

- The processing subsector has a lower concentration of employment compared to the state and actually experienced job loss from 2008 to 2014. The sector is projected to experience additional job loss by 2019, continuing a trend that predates the recession.

- The production sector has a lower concentration of employment relative to the state average, though California is the nation's leading agricultural state.

- The region faces a constrained labor supply for farm laborers, which can inhibit future growth. In addition, there is a projected training shortage for industrial machinery mechanics and farm equipment mechanics/ service technicians.

The study's base modeling projects employment in the cluster to increase a modest 2 percent by 2019. However, when looking at new and replacement jobs, there are more than 5,000 total job openings over the next five years. The development of cluster action plans and other regional initiatives speak to the Sacramento Capital region's potential to proactively change this trajectory and capitalize on promising market developments, supporting further regional jobs and economic activity.

In short, this report demonstrates the direct contribution of Food and Agriculture industries to the regional economy and begins to illustrate how agricultural cultivation of food and fiber creates jobs and generates income, both on and off the farm. The full economic impact of an industry cluster extends throughout its entire value chain. Due to data limitations however, this cluster analysis does not include related food system elements such as retail and consumption establishments or other activity in R&D, environmental services, or agritourism. As such, the data and analysis contained in the report constitute an important initial—though still incomplete—examination of the cluster and its role in the Sacramento Capital region's economy. Future work will build upon this analysis, including SACOG's Food System Multiplier project that delves into the Food and Agriculture cluster's full ripple effect, modeling how the direct economic output of food and agriculture industries circulates throughout and contributes to the larger regional economy.

APPENDIX A: FOOD AND AGRICULTURE CLUSTER DEFINITION

The following NAICS codes comprise the Food and Agriculture cluster:

Processing

311111   Dog and Cat Food Manufacturing

311119   Other Animal Food Manufacturing

311211   Flour Milling

311212   Rice Milling

311213   Malt Manufacturing

311221   Wet Corn Milling

311224   Soybean and Other Oilseed Processing

311225   Fats and Oils Refining and Blending

311230   Breakfast Cereal Manufacturing

311313   Beet Sugar Manufacturing

311314   Cane Sugar Manufacturing

311340   Non-chocolate Confectionery Manufacturing

311351   Chocolate and Confectionery Manufacturing from Cacao Beans

311352   Confectionery Manufacturing from Purchased Chocolate

311411   Frozen Fruit, Juice, and Vegetable Manufacturing

311412   Frozen Specialty Food Manufacturing

311421   Fruit and Vegetable Canning

311422   Specialty Canning

311423   Dried and Dehydrated Food Manufacturing

311511   Fluid Milk Manufacturing

311512   Creamery Butter Manufacturing

311513   Cheese Manufacturing

311514   Dry, Condensed, and Evaporated Dairy Product Manufacturing

311520   Ice Cream and Frozen Dessert Manufacturing

311611   Animal (except Poultry) Slaughtering

311612   Meat Processed from Carcasses

311613   Rendering and Meat Byproduct Processing

311615   Poultry Processing

311710   Seafood Product Preparation and Packaging

311811   Retail Bakeries

311812   Commercial Bakeries

311813   Frozen Cakes, Pies, and Other Pastries Manufacturing

311821   Cookie and Cracker Manufacturing

311824   Dry Pasta, Dough, and Flour Mixes Manufacturing from Purchased Flour

311830   Tortilla Manufacturing

311911   Roasted Nuts and Peanut Butter Manufacturing

311919   Other Snack Food Manufacturing

311920   Coffee and Tea Manufacturing

311930   Flavoring Syrup and Concentrate Manufacturing

311941   Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing

311942   Spice and Extract Manufacturing

311991   Perishable Prepared Food Manufacturing

311999   All Other Miscellaneous Food Manufacturing

312111   Soft Drink Manufacturing

312112   Bottled Water Manufacturing

312113   Ice Manufacturing

312120   Breweries

312130   Wineries

312140   Distilleries

312230   Tobacco Manufacturing

Distribution

424410   General Line Grocery Merchant Wholesalers

424420   Packaged Frozen Food Merchant Wholesalers

424430   Dairy Product (except Dried or Canned) Merchant Wholesalers

424440   Poultry and Poultry Product Merchant Wholesalers

424450   Confectionery Merchant Wholesalers

424460   Fish and Seafood Merchant Wholesalers

424470   Meat and Meat Product Merchant Wholesalers

424480   Fresh Fruit and Vegetable Merchant Wholesalers

424490   Other Grocery and Related Products Merchant Wholesalers

424510   Grain and Field Bean Merchant Wholesalers

424520   Livestock Merchant Wholesalers

424590   Other Farm Product Raw Material Merchant Wholesalers

424810   Beer and Ale Merchant Wholesalers

424820   Wine and Distilled Alcoholic Beverage Merchant Wholesalers

APPENDIX A: FOOD AND AGRICULTURE CLUSTER DEFINITION

424940	Tobacco and Tobacco Product Merchant Wholesalers
493120	Refrigerated Warehousing and Storage
493130	Farm Product Warehousing and Storage
722310	Food Service Contractors

Support

115210	Support Activities for Animal Production
325311	Nitrogenous Fertilizer Manufacturing
325312	Phosphatic Fertilizer Manufacturing
325314	Fertilizer (Mixing Only) Manufacturing
325320	Pesticide and Other Agricultural Chemical Manufacturing
333111	Farm Machinery and Equipment Manufacturing
333241	Food Product Machinery Manufacturing
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers
424910	Farm Supplies Merchant Wholesalers
424930	Flower, Nursery Stock, and Florists' Supplies Merchant Wholesalers

Production

111110	Soybean Farming
111120	Oilseed (except Soybean) Farming
111130	Dry Pea and Bean Farming
111140	Wheat Farming
111150	Corn Farming
111160	Rice Farming
111191	Oilseed and Grain Combination Farming
111199	All Other Grain Farming
111211	Potato Farming
111219	Other Vegetable (except Potato) and Melon Farming
111310	Orange Groves
111320	Citrus (except Orange) Groves
111331	Apple Orchards
111332	Grape Vineyards
111333	Strawberry Farming
111334	Berry (except Strawberry) Farming
111335	Tree Nut Farming

111336	Fruit and Tree Nut Combination Farming
111339	Other Non-Citrus Fruit Farming
111411	Mushroom Production
111419	Other Food Crops Grown Under Cover
111421	Nursery and Tree Production
111422	Floriculture Production
111910	Tobacco farming, Field and Seed Production
111920	Cotton Farming
111930	Sugarcane Farming
111940	Hay Farming
111991	Sugar Beet Farming
111992	Peanut Farming
111998	All Other Miscellaneous Crop Farming
112111	Beef Cattle Ranching and Farming
112112	Cattle Feedlots
112120	Dairy Cattle and Milk Production
112130	Dual-Purpose Cattle Ranching and Farming
112210	Hog and Pig Farming
112310	Chicken Egg Production
112320	Broilers and Other Meat Type Chicken Production
112330	Turkey Production
112340	Poultry Hatcheries
112390	Other Poultry Production
112410	Sheep Farming
112420	Goat Farming
112511	Finfish Farming and Fish Hatcheries
112512	Shellfish Farming
112519	Other Aquaculture
112910	Apiculture
112920	Horses and Other Equine Production
112930	Fur-Bearing Animal and Rabbit Production
112990	All Other Animal Production
115111	Cotton Ginning
115112	Soil Preparation, Planting, and Cultivating
115113	Crop Harvesting, Primarily by Machine
115114	Postharvest Crop Activities (except Cotton Ginning)
115115	Farm Labor Contractors and Crew Leaders
115116	Farm Management Services

MORE ABOUT...

More About The Centers of Excellence

The Centers of Excellence (COE) for Labor Market Research deliver regional workforce research and technical expertise to California community colleges for program decision making and resource development. This information has proven valuable to colleges in beginning, revising, or updating economic development and Career Technical Education (CTE) programs, strengthening grant applications, assisting in the accreditation process, and in supporting strategic planning efforts.

The Centers of Excellence Initiative is funded in part by the Chancellor's Office, California Community Colleges, Economic and Workforce Development Program. The Centers aspire to be the leading source of regional workforce information and insight for California community colleges. More information about the Centers of Excellence is available at **www.coeccc.net**.

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More About Valley Vision

Since 1994, Valley Vision's work has driven transformative change and improved lives across Northern California. An independent social impact and civic leadership organization headquartered in Sacramento, Valley Vision strengthens our communities through unbiased research, boundary-crossing collaboration and change leadership. Our work improves overall quality of life and creates the conditions for economic prosperity and community health and vitality.

More About Sacramento Area Council of Governments (SACOG)

The Sacramento Area Council of Governments (SACOG) is an association of local governments in the six-county Sacramento Region. Its members include the counties of El Dorado, Placer, Sacramento, Sutter, Yolo, Yuba and the 22 cities within. SACOG provides transportation planning and funding for the region, and serves as a forum for the study and resolution of regional issues. SACOG is the principal researcher for this report.

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